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Cross-country determinants of life satisfaction: exploring different determinants across groups in society

Christian Bjørnskov · Axel Dreher · Justina A. V. Fischer

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Abstract This paper explores a wide range of cross-country determinants of life satisfaction exploiting a database of 90,000 observations in 70 countries. We distinguish four groups of aggregate variables as potential determinants of satisfaction: political, economic, institutional, and human development and culture. We use ordered probit to investigate the importance of these variables on individual life satisfaction and test the robustness of our results with Extreme Bounds Analysis. The results show that only a small number of factors, such as openness, business climate, postcommunism, the number of chambers in parliament, Christian majority, and infant mortality, robustly influence life satisfaction across countries while the importance of many variables suggested in the previous literature is not confirmed. This remains largely true when the analysis splits national populations according to gender, income, and political orientation also.

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C. Bjørnskov
Aarhus School of Business, Aarhus, Denmark

A. Dreher (✉)
KOF Swiss Economic Institute, ETH Zurich,
Weinbergstrasse 35, 8092 Zürich, Switzerland
e-mail: mail@axel-dreher.de

J. A. V. Fischer
Hoover Institution, Stanford University, Stanford, USA

1 Introduction

Although the literature on the economics of happiness is relatively new, it has already attracted substantial attention both within academia and, more recently, in political discussions. This increasing attention, not least that of policymakers, raises the pressure for generating robust findings and thereby valid implications. One part of the existing literature has concentrated on exploring individual-level determinants of life satisfaction, while another part analyzes country-specific determinants of satisfaction across states. Clearly, however, happiness research is still to come of age. As Diener and Seligman (2004, p. 3) in their comprehensive survey of the happiness literature note, "a much more systematic approach is needed in order to provide leaders with the best possible well-being indicators." That exactly is the aim of this paper.

As noted, part of the literature explores the determinants of life satisfaction at the individual level. In this part, there is fairly broad consensus on the main determinants of well-being and they are remarkably similar across countries (see, e.g., Oswald 1997; Frey and Stutzer 2002; Diener and Seligman 2004; Hayo 2004). First of all, higher relative income or socio-economic status increases well-being according to virtually all studies. Second, higher levels of education also tend to be positively associated with life satisfaction. Third, being unemployed exerts a strongly negative influence on individual well-being that cannot be alleviated to any substantial degree by the social security net. Life satisfaction depends, fourth, non-linearly on age with satisfaction roughly decreasing until people reach their mid-40 s after which satisfaction increases again. Fifth, social capital in its different dimensions is conducive to life satisfaction (Helliwell 2003; Bjørnskov 2003). Sixth, religiosity or spirituality is often found to be a significant factor of well-being (e.g., Clark and Lelkes 2005). Finally, family status is a strong predictor of individual life satisfaction. Marriage is positively associated with happiness, and having children may also be so, although causality is not yet entirely clear (cf. Frey and Stutzer 2006). Not only is there broad consensus that these variables robustly affect well-being, the literature also stresses that their impact on life satisfaction is remarkably similar across countries (e.g., Hayo 2004).

Conversely, the second strand of the literature attempts to explain cross-country differences by either adding aggregate variables to the micro-model or by analyzing average happiness at the country level. Here, researchers are far from being close to reaching consensus as to which variables are important for well-being. The exception is national income, which is significantly associated with overall life satisfaction until countries reach an average income of approximately 10,000 USD, after which income seizes to be important (Schyns 1998; Frey and Stutzer 2002). Many aggregate variables have been proposed to be major determinants of well-being in some studies, but have been reported to be insignificant in others. Examples are macro-economic factors like volatility of growth and inflation rates, institutional and political factors such as democracy and economic freedom, structure and scope of government, and cultural factors like social capital and gender equality. There is also some discussion about the

impact of welfare state characteristics like social spending and income inequality (e.g., Veenhoven 2000a; Bjørnskov et al. 2007; both contrasting Layard 2006).

What can we learn from the previous literature? Clearly, there is a gap in this literature on the importance of country-level determinants of life satisfaction, as many authors do not show sufficient care in examining the sensitivity of their empirical findings with respect to the inclusion of additional variables to their regressions. As a consequence, it is hard to tell whether the reported significances in a particular regression are really trustworthy and the variables are robustly related to life satisfaction.

The aim of this paper is to fill this gap. We, therefore, analyze to what extent cross-country aggregate economic, political, institutional, and human developmental variables that have been suggested in the literature as influencing life satisfaction are indeed robust determinants. We use Extreme Bounds Analysis (EBA) to do this.[1]

Another gap in the happiness literature is the narrow focus of most of the empirical analyses on entire national populations. Arguably, there is reason to expect that the impact of country-level determinants examined varies between different subpopulations and socio-demographic characteristics. How do economic, political, institutional and human developmental factors affect subjective life satisfaction in different social groups? This is the second question our paper deals with. For this purpose, we use individual World Values Survey data of 70 countries and explore whether 54 different aggregate factors exert differential influence on (a) people in low, middle, and high income groups, (b) men and women, and (c) people voting to the left or the right of the middle, respectively.

Our approach of splitting the population into different groups has major advantages over previous studies: if some factors affect, for example, average life satisfaction of only one particular group in society, estimating its effect on the entire population will tend to bias the coefficient and its significance towards zero and thus disguise its actual importance. Splitting by subgroups, however, also allows the impacts of remaining individual and aggregate determinants to vary between these groups, compared to the inclusion of one interaction term with the variable of interest. Again, we explore the robustness of our results to the inclusion of additional variables using Extreme Bounds Analysis.

We follow Helliwell (2003) in combining individual-level World Values Survey data with variables aggregated at the country level, implicitly assuming that levels of life satisfaction are comparable across individuals.[2] While all regressions in our study thus always include individual-level variables, the focus of the robustness tests is on the macro-level cross-country findings reported in the previous literature. On the one hand, aggregate factors are more subject

[1] The EBA includes additional variables to the regression model and analyzes the entire distribution of estimates for the variables of interest. It is frequently used to test the robustness of empirical results in the recent literature (see, e.g., Fernández et al. 2001; Sturm and de Haan 2005; Sturm et al. 2005). We explain the method in some detail below.

[2] In principle, replies to questions as the one used in this paper are of an ordinal nature and thus may not be reliably comparable across individuals. Nevertheless, there is ample literature supporting this approach (see, e.g., Ng 1997).

to discretion of politicians providing a lever to improving people's well-being, while, on the other hand, individual determinants of life satisfaction have been shown to be quite robust across different countries, economic conditions and political systems.

We continue as follows. Section 2 presents our hypotheses. The methodology and data are described in Sect. 3 while Sect. 4 presents the empirical results. Section 5 presents and discusses our main results while Sect. 6 concludes.

2 Hypotheses

As noted in the introduction, a large number of cross-country factors have been suggested as determinants of life satisfaction. In order to investigate the influence of those aggregate factors on self-reported well-being across various societal groups, our model of life satisfaction combines both aggregate and individual level determinants. The hypotheses discussed below, however, will focus only on country-level determinants of well-being. Due to space restraints, the discussion will mostly refer to their impact on the whole population rather than that on societal sub-groups, although our empirical analysis presents additional findings for samples split according to income, gender or political orientation, and provides explanations for differential impacts.[3]

Our hypotheses can loosely be allocated to four broad sets of explanatory factors under the headings of political, economic, institutional and, respectively, human development as described below.[4]

2.1 Political factors

Political factors clearly affect peoples' lives and should thus be important determinants of individual life satisfaction across nations. In particular, not only (1) the political system, but also (2) the ideology and structure of the ruling government, as well as (3) specific historical experiences such as regime changes can arguably influence well-being. These political factors influence the extent to which the current allocation of goods and resources is in line with people's preferences. They equally determine whether and to what extent politicians are responsive to their citizens, which societal groups are favored or disfavored, and whether conflicting interests are integrated. Finally, political factors influence what people expect at least economically from the future, thereby contributing to people's well-being.

Specifically, based on theoretical political economy models we expect stronger democratic institutions to lead to an allocation of goods and resources closer

[3] Economists in happiness research rarely analyze potentially differential impacts of macro-level determinants by gender. As one exception, Fischer and Rodriguez (2006) investigate the impact of political institutions on male and female suicide rates.

[4] Appendix A reports descriptive statistics.

to citizens' preferences, implying higher individual well-being.[5] It has also been argued that people in older democracies are happier than those in younger democracies, as in the latter democratic institutions do not exist long enough to induce substantial policy changes, or because people in transition countries developed overly optimistic expectations which, then, have not been fulfilled by the new regime (Dorn et al. 2006). Similarly, in analogy to political economy models of federalism we argue that countries' independence could increase life satisfaction as 'local' individual preferences are more respected than under 'distanced' foreign rule.[6] Furthermore, gaining independence entails the often utilized opportunity to eliminate ingrained, unresponsive power structures and remnants of undemocratic systems, as the recent experience of postcommunist Eastern Europe exemplifies. This reasoning leads to the following hypotheses:

1. Countries' degree and age of democracy increases life satisfaction of their citizens.
2. A history of independence is conducive to citizens' well-being.

Regarding ideology and structure of governments, Bauman (1998) argues that shifts towards the political right immiserize the poor as redistributive measures are restrained (even though the overall effect on personal well-being depends on individual political leaning). Greater government fractionalization has been claimed to lead to excessive growth in governments' budgets and exploitation of the tax base as a 'fiscal commons', thereby shrinking people's net income for their own consumption.[7] Fractionalization is also said to substantially slow down political decision-making processes as compromises have to be sought (e.g., Bawn 1999; Ganghof 2003). While this would suggest fractionalization to reduce well-being, participation of a greater number of parties in the political process increases representation of smaller societal groups, potentially benefiting from pork-barrel legislation and log-rolling (see Lijphart 1977).[8] We thus hypothesize:

3. Right-wing political ideology is detrimental to life satisfaction of the poor.
4. Fractionalization reduces well-being; alternatively:
5. Fractionalization increases well-being.

Bicameral legislatures potentially increase the number of veto-players in political systems that can block policy changes, like changes related to the reduction

[5] See Downs (1957), Fernández et al. (2001), Beck et al. (2001) for theoretical models of democracy; for empirical support of higher responsiveness to the median voter's preferences see, e.g., Pommerehne (1978) and Gerber (1996, 1999); for the beneficial impact of citizen empowerment on well-being see Frey and Stutzer (2000) and Dorn et al. (2006).

[6] See the models in, e.g., Brennan and Buchanan (1980), Oates (1972), Bardhan (1997), and Hayek (1939).

[7] See Roubini and Sachs (1989), de Haan and Sturm (1997), Kontopoulos and Perotti (1999), Volkerink and de Haan (2001).

[8] However, see Weingast et al. (1981), Tullock (1981), and Besley and Coate (1997, 1998) on inefficiencies created by such a representative political system.

of government spending.[9] Depending on the status quo, various societal groups will be affected differently by political stability, i.e., by maintaining the current political, economic, and social situation.[10] Regarding monarchy, a common positive trait of European constitutional monarchies as well as absolutist rulers in mostly Arab countries is that the monarch as head of state exerts unifying and stabilizing forces bridging ethnic fractionalization and differences in party ideologies either as a positive role model or as an object of the hatred of his own people (Bjørnskov 2005).[11] Finally, people in postcommunist states experience a hard time of social and economic disorder during their ongoing transition processes, reducing today's life satisfaction and even enhancing their tendency to glorify the more socially stable 'good old days.' Moreover and analogously to the 'age of democracy' hypothesis, compared to countries with well-established democratic governing bodies, people residing in formerly communist states experience political institutions still under development (Heston et al. 2002; Teksoz and Sanfey 2005; Dorn et al. 2006).[12] The foregoing analysis leads to the following hypotheses:

6. Bicameralism decreases well-being.
7. Citizens living in monarchies are more satisfied with their lives.
8. People in post-communist countries are less satisfied with their lives.

2.2 Economic factors

The state of the economy might equally contribute to an individual's life satisfaction. In general, as main economic determinants of well-being the literature proposes (1) absolute levels and variety of private and public goods consumption, (2) an individual's relative income position, or (3) expectations about future income streams. From a purely economic point of view, higher levels of any of these three factors should raise individual well-being.

Turning to the first point, consumption possibilities may depend on the level of personal income, a country's openness to trade, and government provision of public goods. More specifically, individual income is a source of well-being according to almost all standard economic theories.[13] Moreover, openness to

[9] See the theoretical models in Romer and Rosenthal (1978) and Tsebelis (1995); see Bawn (1999), McCubbins (1991) and Alt and Lowry (1994) for empirical evidence.

[10] Traditionally, however, bicameralism with its checks and balances has been viewed more positively and thought to prevent tyranny of a simple majority (or even minority) in legislation, thereby providing political and social stability (e.g., König 2001).

[11] Bjørnskov (2005) finds that monarchies have substantially more trusting populations, suggesting that the monarch exerts such a unifying effect on society. For a list of monarchist countries, see http://www.cosmoedu.net/politicalscience.html#monarchies (18 May 2005).

[12] Yet, communism as such may also have left indelible long-term changes in individual norms, attitudes and risk perceptions that affect life satisfaction (cf. Bjørnskov 2005), making it an important cultural factor.

[13] A positive impact of current or lagged GDP on 'happiness' was found in DiTella et al. (2003). However, virtually no study reports an impact of national income on life satisfaction in countries where the majority of the population have their basic needs covered.

trade and globalization might imply higher welfare due to lower international price levels and greater variety of goods, both implying an increased ability to make purchases closer to one's preferences (Lancaster 1980; Dixit and Stiglitz 1977).[14]

Consumption possibilities are also influenced by governments which provide, aside from private goods, also important public goods such as education and infrastructure. These goods do not only affect today's bundle of consumption goods, but also provide the basis for future economic prosperity. Moreover, expansion of government production into particular areas might lower inefficiencies in private consumption due to consumers' bounded rationality, leading to excessive consumerism, for example as in (Ng 2003). Yet, on the other hand, governments and public administrations do not have full information on citizens' preferences, and bureaucrats and administrators have been shown to seek rents and maximize their budgets beyond the point of optimality, so that more government spending decreases overall well-being (e.g., Niskanen 1975; Bjørnskov et al. 2007). We thus hypothesize:

9. GDP per capita increases well-being.
10. Globalization increases well-being.
11. Government consumption increases well-being; alternatively:
12. Government consumption reduces well-being.

As a second group of economic factors, the actual degree of income inequality and related redistributive government policies might well affect personal socio-economic positions and perceived fairness of the allocation of resources in society. First, the degree of income inequality affects the relative income position of individuals and might thus influence their well-being. While a number of individual-level studies have shown that personal income distance to a comparison group matters for happiness (e.g., Fox and Kahneman 1992), the direction of its impact on people with income below the median, however, is not obvious a priori. Comparably poor people might be negatively influenced by inequality when envy prevails, yet greater income inequality could also entail greater opportunities. In particular, poor people in unequal, but dynamic societies might expect to increase their income over time, while the chances of escaping poverty are smaller when all are equally poor. Regarding life satisfaction of people with above median income the impact of inequality is also indeterminate and depends on the relative strengths of two opposing effects: The positive feeling of being in a comparably good social position and

[14] See Dreher (2006a,b) for a summary, and an empirical test of how globalization affects economic policy and, respectively, economic growth. However, globalization also produces losers in those economic sectors with a comparative disadvantage (e.g., Bauman 1998), who might experience declining income (Dixit and Norman 1980). Traditionally, low-skilled workers are among the losers in industrial countries, whereas they are among the winners in developing or transition countries. Furthermore, globalization might also increase uncertainty, and, finally, might reversely impact individuals' relative income position (Dreher and Gaston 2006), thus decreasing subjective well-being.

the fear of becoming forcefully deprived by those worse off.[15] In any case, we expect to observe different impacts of income inequality between low income and high income groups. Overall we hypothesize:

13. Inequality reduces well-being; alternatively:
14. Inequality increases well-being.

A similar interpretation potentially applies to welfare transfers and subsidies and the top marginal tax rate as measures of the welfare system and progressivity of income taxes. If welfare payments and income redistribution via the tax system are correctly targeted according to their stated goals, they should decrease income inequality and raise disposable income of the needy. In consequence, such government activities might reduce distributional conflicts between societal groups and so lead to less crime, enhancing the well-being of all members of society alike. Also, persons with a leftist ideology should be more in favor of redistributive measures (for theory and empirical evidence, see Alesina et al. 2004).[16] If, however, social mobility is perceived as high, (potential) welfare recipients might even fear the costs of redistribution more than they value its benefits. On the other hand, higher marginal tax and welfare payments might also be linked to wasteful government spending, making all equally worse off (Bjørnskov et al. 2007). Finally, access to technology might reversely impact individuals' perceived income position by changing their reference groups and thus decreasing their well-being (Bruni and Stanca 2006).[17] This discussion implies the following hypotheses:

15. Redistribution reduces well-being; alternatively:
16. Redistribution increases well-being.
17. Access to technology reduces well-being.

As noted above, economic instability is arguably associated with lower life satisfaction as it negatively affects people's expectations about their future position (Graham and Pettinato 2001). Economic uncertainty is generated by fluctuations in overall business climate and economic cycles—reflected by GDP growth, public debt, unemployment, and inflation.

Clearly, economic uncertainty and instability may lead to financial and psychological costs for all groups in society alike, as all might be subject to its adverse consequences. However, a high unemployment rate might for some

[15] Living in a dynamic society and fear of property crime are among the explanations of the differential impact of inequality between income groups in the USA compared to European countries (Alesina et al. 2004).

[16] Income inequality and unemployment rates were shown to negatively affect only persons with a leftist orientation, but not those being more conservative. Similarly, a robust positive influence of a more generous unemployment benefit system on happiness is reported in DiTella et al. (2003).

[17] However, taking into account the 'homo ludens' facet of human existence, access to modern technology might equally raise people's well-being as they have a new gadget to play with. This aspect is often addressed through design features that are not determined by usability of the item (e.g., fancy beeping sounds, extraterrestrial outlook, etc). We thank an anonymous referee for hinting at this contrasting possibility.

persons reflect a higher risk of becoming unemployed than for others.[18] Most likely, higher unemployment rates will exert the strongest negative effect on low-skilled persons and female workers, as in many countries among our sample there is an oversupply of unskilled labor (at given wage levels). Furthermore, in times of recession women are often laid off faster than their male colleagues. As regards GDP growth, higher growth rates imply future rises in personal incomes which should be positive for all societal groups. Indeed, a positive impact on happiness is reported in DiTella et al. (2003). The level of public debt to GDP, however, can proxy for bad governance of politicians or an ongoing recession which often gives reason to later increase tax rates and to cut government spending on welfare, investments, infrastructure, and education. Moderate growth thus to some extent measures expected future well-being, while an overheating economy can generate economic upheavals and social unrest. Finally, inflation reduces real income and devalues savings, probably decreasing consumption and investment.[19] Therefore:

18. Economic environments with stable and moderate growth increase well-being.

2.3 Institutional factors

Institutions have also been proposed to affect life satisfaction (Helliwell 2006; Ovaska and Takashima 2006). In general, institutions provide the setting for successful market transactions, and ensure the functioning of facilities and administrations; furthermore, they enhance coping with the difficulties of daily life and provide (philosophical) guidelines for a better living. The various types of formal and informal institutions, potentially important for well-being, relate to (1) governance, (2) social interaction between citizens, and (3) quasi-exogenously given cultural heritage, such as religion or ethnic diversity.

More specifically, aspects of good governance such as legal quality, the quality of business regulations and the absence of corruption reduce enforcement costs of law and make—according to economic models of crime (Becker 1968)—the adherence to business and private contracts more likely. Thus, market transactions are facilitated and economic uncertainty is reduced. Likewise, a free and unrestrained press increases transparency and makes it easier for citizens to control politicians and other important decision-makers in society. However, unrestrained media may also be more likely to direct attention to adverse events that could potentially create anxiety and thus decrease well-being. In sum, however, most of these aspects of formal institutions can arguably be expected to positively affect life satisfaction. More specifically, the discussion implies:

19. Good governance and high quality of institutions increase well-being.

[18] Graham and Pettinato (2001) find a strong negative effect of inflation and unemployment on life satisfaction and explain this by economic uncertainty. Similarly, a negative impact of inflation and unemployment is reported in DiTella et al. (2001, 2003).

[19] Alesina et al. (2004) report inflation to reduce happiness in the USA and European countries.

Regarding institutions that influence citizens' interactions, we follow Putnam's (1993) seminal work, suggesting social capital, defined as trust, norms and networks, to affect life satisfaction positively (see also Bjørnskov 2003; Helliwell 2003). Apart from fostering social cohesion and connectedness, countries with high levels of social capital are characterized by more honest behavior in general (e.g., Knack 2001)—factors that all should lead to more life satisfaction.[20] Similarly, a higher degree of confidence in governing structures and the decisions of their representatives, captured by confidence in parliament, might influence life satisfaction as people perceive formal institutions to be fair and effective. We hypothesize:

20. Vertical and horizontal trust increase well-being.

Turning to more exogenous, informal norms and institutions, religion is likely to be important for peoples' satisfaction with their lives (Keefer and Knack 2002). Equally, differences in traditional informal institutions might well be reflected by ethnic groups. Consequently, ethnic heterogeneity might well be linked with social tensions between different societal groups, becoming manifest in occurrences of violent crime or even civil war, decreasing peoples' well-being. Thus, the prediction on the influence of ethnic diversity as clash of culture is clear-cut and should be negative, while the effect of the share of various religious groups on well-being might depend on their associated philosophy (e.g., Dorn et al. 2006). Therefore:

21. Ethnic diversity decreases well-being.
22. Religion affects well-being.

2.4 Human development and culture

Turning to dimensions of human development, potential determinants of the quality of life include aspects such as the provision of public goods related to health care, or access to education promising future higher income streams, discrimination of women, as well as geographical factors. Finally, cultural values might equally affect well-being.

First of all, infant mortality, life expectancy, and fertility are central and objective measures of the quality of life. A more developed welfare state and healthcare system should lead to an increase in longevity, lower infant mortality, and a lower number of children.

Also, education in primary and secondary schools forms part of the quality of human life. Missing education of children is linked to contemporary parental poverty, on the one hand, but, on the other, is equally associated with jeopardizing the financial future for the child (and sometimes for the parents also). For this reason, access to public education of children might be particularly important for low-income families. Furthermore, schooling also makes people more

[20] More recently, Uslaner (2002) and Bjørnskov (2005) have shown that these effects are entirely due to generalized trust.

informed about the state of society and the surrounding world which enables them to better understand and assess potential risks and opportunities. This ability arguably ought to clear away some uncertainty about the future course of life.[21] These considerations imply the following hypotheses:

23. Health (care) increases well-being.
24. Education increases well-being.

Gender discrimination (gender equality) might be expected to have a negative (positive) effect on individual life satisfaction, in particular on those of women and persons with leftist ideology (Schyns 1998; Bjørnskov et al. 2006; Veenhoven 2000b). However, given that the existence of discrimination induces conflicts between genders, it could be equally well expected that the effects exist for both sexes:[22]

25. Gender discrimination reduces well-being.

Arguably, geographical factors might also affect life satisfaction. Generally speaking, a moderately warm and friendly climate could make people feel more satisfied with their lives by, e.g., relieving them of the physical stress of extreme temperatures. For this reason, people living in extreme cold or in the desert may be less satisfied:

26. A moderate climate is conducive to life satisfaction.

Finally, Dorn et al. (2006) show that persons residing in predominantly English-speaking countries systematically report higher levels of subjective happiness than persons in other countries. This reflects either a different perception or definition of 'happiness' in this culture or some British institutional characteristics in former British colonies. Our final hypothesis is thus:

27. People in predominantly English-speaking countries are more satisfied with their lives.

3 Method and data

Due to data restrictions and the relative invariance of observed levels of well-being over time as compared to its variability across countries we estimate cross-section regressions. Data on reported levels of life satisfaction and individual control variables are taken from the World Values Survey (WVS) and cover individuals in more than 70 countries over the period 1997–2000.[23] Societal

[21] However, being better informed may also reduce people's chances of being happily ignorant.

[22] It might well be that the absence of discrimination and complete discrimination constitute two separate and stable equilibria between genders, whereas the existence of some discrimination is a sign that society is on a painful transition path from one state to the other.

[23] Note that the World Values Survey distinguishes 'life satisfaction' from 'happiness', which is used in some of the studies cited here (e.g., Veenhoven 2000). The correlation between happiness and satisfaction is surprisingly low ($\rho = 0.44$). The exact question we employ in this paper is: "All things considered, how satisfied are you with your life as a whole these days?" A card was then shown to the interviewee with a scale ranging from 1 (dissatisfied) to 10 (satisfied).

groups are chosen based on either self-reported income levels (low, middle, and high), gender, or political orientation. The full sample contains about 90,000 individuals, which is roughly divided in half by gender and drops to about 30,000 when dividing the sample according to ideology or income groups. Note that—in particular — people reporting either left-wing or right-wing ideology do not add up to the full sample—people without strong political views or those not reporting their views are missing.

Our dependent variable, self-reported life satisfaction, is measured in the WVS on a ten-point scale ranging from 1 (completely dissatisfied) to 10 (completely satisfied). As a consequence, our empirical approach implicitly assumes that categories of life satisfaction are—at least to a substantial degree—interpersonally comparable (for psycho-neurological justification, see, e.g., Ng 1997), though avoiding to assume cardinality. Regarding the choice of explanatory individual variables, we follow the previous literature (introduced above). The aggregate variables are chosen so as to correspond to the hypotheses introduced in the previous section. Table 1 shows the aggregate variables used to test the hypotheses formulated above, their sources and corresponding hypotheses while Appendix A provides descriptive statistics.

While most of the variables in Table 1 are straight forward, some may need further explanation. To test our political and institutional hypotheses, we employ, among others, a number of well-known democracy and governance indicators, and a measure of political ideology.[24] The ideology measure is introduced in Bjørnskov (2005) and ranges from −1 to 1, with higher values reflecting more right-wing governments. By averaging over a decade, this indicator is likely to reflect both government ideology itself as well as real, ideologically determined policy changes. Fractionalization is measured employing the Herfindahl index of the legislature, which is calculated as the sum of squared shares of seats in parliament held by any government party.

Among the variables testing for our economic hypotheses, we employ conventional variables such as GDP per capita and the Gini coefficient.[25] Unemployment, inflation, and GDP growth proxy economic uncertainty. The business climate is taken into account by a country's investment price level relative to that of the USA, proxying the returns to investments. We also employ the share of public debt to GDP as a proxy for instability. Furthermore, we use a composite index of access to modern technology to control for the potential impact of new forms of communication and access to information.

In addition to standard proxies for globalization like openness to trade and import tariffs, we employ the KOF index of globalization developed in Dreher

[24] The measure of overall governance is the average of all six indices in Kaufmann et al. (2003), covering voice and accountability, political stability, control of corruption, rule of law, regulatory quality and government effectiveness. Although Kaufmann et al. (2003) argue for the opposite, Bjørnskov (2005) shows that the six indices cannot be separated statistically and therefore all measure one underlying governance factor. Using the overall measure thus might capture effects that any of the six subindices fail to sufficiently proxy for.

[25] Note that the Gini coefficient does not necessarily measure relative income positions. However, it is the best proxy available.

Table 1 Variables used to test the hypotheses

Hypothesis	Variable used	Source
Political factors		
1. Countries' degree and age of democracy increases life satisfaction of their citizens.	Gastil Index, distributed from 1 (full political rights) to 7 (no political rights); Polity IV Index of Democracy, distributed from 0 (no rights) to 10 (full rights); the number of years a country is a democracy measured by the number of years they have consecutively had full political rights.	Freedom House (2005), Marshall and Jaggers (2003)
2. A history of independence is conducive to citizens' well-being	The number of years a country has been independent	CIA (2005)
3. Right-wing political ideology is detrimental to life satisfaction of the poor	Political ideology measuerd on a scale from −1 (fully leftwing) to 1 (fully rightwing), either in 10-year averages or by ideology of the incumbent government at the time of the survey	Bjørnskov (2005)
4/5. Fractionalization reduces/increases well-being	Herfindahl index of the legislature, measured from 0 (full fractionalization) to 1 (one-party state)	Beck et al. (2001)
6. Bicameralism decreases well-being	Number of chambers in parliament	CIA (2005)
7. Citizens living in monarchies are more satisfied with their lives	Dummy for countries with a monarchy	CIA (2005)
8. People in post-communist countries are less satisfied with their lives	Dummy for countries with communist past	CIA (2005)
Economic factors		
9. GDP per capita increases well-being	Natural logarithm of GDP per capita measured in purchasing-power adjusted US dollars	Heston et al. (2002)
10. Globalization increases well-being	Sum of exports and imports in percent of GDP; KOF index of globalization; average import tariff rate	World Bank (2005); Dreher (2006a, 2006b); Gwartney and Lawson (2002); Heston et al. (2002)
11/12. Government consumption increases/reduces well-being	Government consumption in percent of GDP, measured in international prices	Heston et al. (2002)
13/14. Inequality reduces/increases well-being	Gini coefficient of gross income	UNU (2005)
15/16. Redistribution reduces/increases well-being	Transfers and subsidies in percent of GDP; top marginal tax rate	Gwartney and Lawson (2002)
17. Access to technology reduces well-being	Composite index of access to modern technology measured as the share of population with access to mobile phones, internet and cable TV	World Bank (2005)

Table 1 continued

Hypothesis	Variable used	Source
18. Economic environments with stable and moderate growth increase well-being	Inflation rate; unemployment rate; total GDP growth of the last five years; variance of GDP growth rate; public debt in percent of GDP; investment price level relative to that of the USA	Heston et al. (2002), World Bank (2005)
Institutional factors		
19. Good governance and high quality of institutions increase well-being	Overall governance, distributed from −2.5 to 2.5 (optimal governance); quality of the legal system and the quality of regulations, distributed from 0 to 10 (optimal quality); press freedom distributed from 1 (full freedom) to 100 (no freedom); lack of corruption distributed from 0 (all-pervasive corruption) to 10 (no corruption)	Kaufmann et al. (2003), Gwartney and Lawson (2002), Transparency International (2005)
20. Vertical and horizontal trust increase well-being	Share of people stating that most people can be trusted (social trust); average confidence in parliament on a scale from 1 (full confidence) to 4 (no confidence)	Inglehart et al. (2004)
21. Ethnic diversity decreases well-being	Ethnic diversity, measured as the probability that two random citizens do not share ethnicity	Alesina et al. (2003)
22. Religion affects well-being	Shares of Protestants, Catholics, Orthodox, Hindi, Buddhists, and Muslims in the population	CIA (2005), USDS (2005)
Human developmental/ cultural factors		
23. Health (care) increases well-being	Life Expectancy in years; infant mortality; number of children per fertile woman ("fertility")	World Bank (2005)
24. Education increases well-being	Enrollment rates in primary and secondary schooling, in percent of a generation; average IQ	Barro and Lee (1993)
25. Gender discrimination reduces well-being	Ratio of girls to boys in primary schools	Barro and Lee (1993)
26. A moderate climate is conducive to life satisfaction	Average temperature in country's capital city; latitude; longitude	CIA (2005)
27. People in predominantly English-speaking countries are more satisfied with their lives	Dummy for countries with English as primary language	CIA (2005)

(2006a,b).[26] The index is based on a large number of variables that relate to the three main dimensions of globalization—economic integration, political integration, and social integration. The individual variables have been combined to form six groups: actual flows of trade and investment, restrictions of international transactions, variables measuring the degree of political integration, variables quantifying the extent of personal contacts with people living in foreign countries, variables measuring trans-border flows of information, and a proxy for cultural integration.[27]

As indicators of social capital, we include the share of people stating that most other people can be trusted (a measure of so-called generalized trust, which is horizontal), and a country's average confidence in parliament on a scale from 1 (full confidence) to 4 (no confidence), a measure of so-called vertical trust.

Finally, besides the quality of public goods indicators, we employ the country average IQ score in addition to standard school enrollment measures of education. As a measure of the quality of schooling, IQ averages probably capture the extent to which the education system provides people with analytical skills, and as such may provide a decent proxy for the quality of the educational system.[28]

Our econometric analysis comprises three steps: first—for the whole population—we derive a baseline model consisting of both individual and cross-country aggregate variables that have been suggested in the previous literature. Second, we add the remaining aggregate variables one by one to the model for the whole sample and the various groups of gender, income and political orientation. Third, we employ Extreme Bounds Analysis (as outlined below) to test the robustness of the aggregate variables of the baseline model — again for the full sample and the subpopulations. Given the structure of the data we employ ordered probit regressions for both steps. Data are clustered at the country level to avoid inflated significance levels of the aggregate variable coefficients (Moulton 1990). Note that this also corrects the standard errors for heteroscedasticity.

The individual-specific variables to be included in the baseline model are selected according to the previous literature outlined in the introduction. We use 54 variables controlling for income, age, gender, education, employment status, family status, type of religion and religiosity, trust and political ideology. The

[26] The index has recently been used to analyze the impact of globalization on various economic, political and social outcomes. For example, Dreher (2006a) studies the impact on the size of government, Dreher (2006b) focuses on economic growth, Tsai (2007) examines human well-being, Dreher and Gaston (2005) examine the impact on inequality, Bjørnskov (2006) studies the effects on economic freedom, Bergh (2006) analyzes the impact on the welfare state, and Lamla (2005) the impact on pollution. The data and detailed description is available at http://www.globalization-index.org.

[27] The correlation between standard openness measures and national income is about −0.7, but the Variance Inflation Factors (VIFs) are consistently low, so there is no problem identifying effects due to collinearity. The same potential worries apply to our measures of governance, but VIFs again reject that collinearity is a problem.

[28] Intelligence might be to some extent inherited, i.e., a matter of genes. However, whether the standard IQ tests primarily measure genetic dispositions or the quality and quantity of schooling is a question on which we prefer to remain agnostic.

aggregate variables to be included in the baseline model are selected employing a general-to-specific procedure. We start with the most comprehensive model, consisting of the micro- and macro-level variables most prominently suggested in the previous literature—although we have included only those aggregate variables that do not reduce the number of countries in our sample below 70. We then consecutively eliminate those variables with the lowest t-statistic, which is standard procedure (see, e.g., Hendry 2001). However, all aggregate variables—including those available for a small number of countries only—are employed in our robustness tests.

In our empirical model, life satisfaction is a function of a vector M containing the aggregate and individual variables for person j that form our baseline specification. More specifically, we determine the probability of observing a particular level of well-being by the probability that an underlying score is within the range of two particular cut points k_{i-1} and k_i for the estimated outcome i (life satisfaction level i). This score is obtained by estimating a linear function of the independent variables in M plus a random error u. As such, we estimate the probability that individual j reports a level of life-satisfaction i.

$$\Pr(\text{outcome} = i) = \Pr(k_{i-1} < \beta' M + u \leq k_i). \tag{1}$$

We test the sensitivity of our results along two dimensions. First, we explore the robustness of our baseline model to the choice of covariates. Clearly, one of the main challenges in empirical analysis when there is no established benchmark is coming up with a reliable and robust model. To examine which explanatory variables are robustly related to our dependent variable, we add additional aggregate variables one at the time to the baseline model and, more importantly, employ variants of the so-called Extreme Bounds Analysis (EBA) as suggested by Leamer (1983) and Levine and Renelt (1992).

The EBA has been widely used in the economic growth literature.[29] The central difficulty in empirical research—which also applies to the present paper—is that several different models may all seem reasonable given the data, but yield different conclusions about the parameters of interest. As pointed out by Temple (2000), presenting only the results of the model which is preferred by the author(s) can be misleading. This problem is ameliorated by the EBA, which can be exemplified as follows. Equations of the following general form are estimated:

$$\Pr(\text{outcome} = i) = \Pr(k_{i-1} < \beta' M + aF + \gamma' Z + u \leq k_i), \tag{2}$$

where Pr(outcome = i) is the dependent variable; M is a vector of 'standard' explanatory variables in our baseline model; F is the variable of interest; Z is a vector of up to two possible additional explanatory macro variables, which according to the literature may be related to the dependent variable; and u is an

[29] See Sturm and de Haan (2005) for further discussion.

error term.[30] Thus, in the EBA one variable at a time enters the F-vector, with up to two other variables entering the regression in all possible combinations (Z-vector) in addition to the variables of the baseline model (M-vector). In total, given the sample size in this paper, each result of the EBA is based on more than 800 regressions. As all variables in the Z-vector enter in all possible combinations, the EBA has the major advantage that it circumvents the trade-off between including as many observations as possible and covering a wide range of explanatory variables faced by conventional regression analysis in the presence of incomplete data.

Traditionally, the extreme bounds test for variable F states that if the lower extreme bound for β—i.e., the lowest value for β minus two standard deviations—is negative, while the upper extreme bound for β—i.e., the highest value for β plus two standard deviations — is positive, the variable F is not robustly related to the dependent variable. A robust relation, however, is present when the upper and the lower bounds are at the same side of zero.

As argued by Temple (2000), it is rare in empirical research that we can say with certainty that one model dominates all other possibilities in all dimensions. In these circumstances, it makes sense to provide information about how sensitive the findings are to alternative modeling choices. Traditionally, the upper and lower bounds of β obtained by the EBA as described above provide a relatively simple criterion for such a test. Sala-i-Martin (1997), however, argues that this test often poses too rigid a threshold: if the distribution of β has some positive and some negative support, then one is bound to find at least one regression for which the estimated coefficient changes sign if a sufficient number of regressions are run. For this reason, we follow Sala-i-Martin's (1997) suggestion to analyze the entire distribution of estimates, in particular the unweighted cumulative distribution function CDF(0), i.e., the fraction of the cumulative distribution function lying on one side of zero. In addition, we also report the percentage of the regressions in which the coefficient is significantly different from zero at the 5 % level, along with the unweighted parameter estimate of β and its standard deviation. In this paper, we will base our conclusions regarding the robustness of variables on the Sala-i-Martin variant of the EBA.[31]

In what follows, we turn to the description of the results of our empirical analysis.

[30] Inclusion of up to two variables is in line with the EBA literature, although Levine and Renelt propose three variables instead. However, given the huge dataset underlying our analysis, available computational power does not allow performing these regressions in reasonable time. In any case, restricting the vector Z to two variables is unlikely to change the results when the base model consists of a substantial number of aggregate and individual control variables, as is the case here.

[31] Sala-i-Martin (1997) proposes using the (integrated) likelihood to construct a weighted CDF(0). However, the varying number of observations in the regressions due to missing observations in some of the variables poses a problem. Sturm and de Haan (2001) show that as a result this goodness of fit measure may not be a good indicator of the probability that a model is the true model and the weights constructed in this way are not equivariant for linear transformations in the dependent variable. Hence, changing scales will result in rather different outcomes and conclusions. We therefore restrict our attention to the unweighted version.

4 Empirical results

Table 2 presents the coefficients, significance levels and marginal effects for the individual level variable specification and the reduced model (the *M*-vector). The first column is based on 78 countries, while the second regression refers to 70 countries. As can be seen, in both models most of the individual determinants of well-being are significant at conventional levels, with coefficients confirming the results of the previous literature. Specifically, well-being is significantly affected by gender, age, tertiary education, income, occupational status, marital status and family type, religion, frequency of service attendance, generalized trust, confidence in national parliament, and political ideology of the respondents. Note that we keep the insignificant individual variables in our baseline model; however, their exclusion does not change the results.

As the second column of Table 2 shows, eight aggregate determinants of well-being are chosen by the general-to-specific step-by-step elimination (and are thus significant at the ten percent level at least): infant mortality, the number of years the country has been independent, the shares of Catholics and Protestants in the population, having a bicameral political system, openness to trade, the investment price level relative to the USA, and postcommunist past.[32] As such, the baseline model reflects effects of such diverse factors as health, religion, institutional characteristics, and purely economic effects. For selecting the baseline model, in addition, we have also kept the regional dummies for Asia, Latin America, the Middle East and Northern Africa, and Sub-Saharan Africa (with Europe and North America forming the base group).[33]

According to the results, well-being rises with economic openness, which is in line with standard economic trade theory, but opposite to popular beliefs. The result is thus in line with our hypothesis 10. Life satisfaction also increases with higher relative investment prices (hypothesis 18) but is substantially lower in countries with a communist past (hypothesis 8). The number of years a country has been independent significantly decreases life satisfaction, contradicting our hypothesis 1. Based on the aspiration level theory, independence might temporarily raise people's expected satisfaction because independence may constitute a possibility to overturn an old system that people have been unhappy with. However, with time passing people adapt and fall back to their prechange set points. Similarly, positive changes in the political system might induce high expectations about positive personal future developments (e.g., a rising

[32] In comparison to the first working paper version of this paper (Bjørnskov et al. 2005), in which the baseline was based on aggregate variables only, the average level of social trust in society is not significant. Most probably, its effect is proxied both by the level of generalized trust measured at the individual level as well as by the religion variables. Equally, government consumption is not significant when aggregate factors are combined with micro data. Overall, however, the variables chosen as aggregate determinants of well-being here are pretty much in line with those reported to be robust in the working paper version.

[33] These dummies account for shared cultural and historical characteristics. Two of them, Latin America and North Africa, are highly significant, while the remaining two are kept for reasons of consistency, with all four dummies being jointly highly significant.

Table 2 Determinants of life satisfaction, baseline model

	Micro model		Reduced model	
	Coefficient	mfx	Coefficient	mfx
Individual level variables				
Buddhist	−0.110	−0.020	−0.057	−0.010
Muslim	−0.489***	−0.077	0.032	0.006
Catholic	0.012	0.002	−0.087**	−0.015
Protestant	−0.112	−0.021	−0.121*	−0.020
Orthodox	−0.627***	−0.091	−0.230***	−0.036
Other Christian denomination	−0.475**	−0.071	−0.130*	−0.021
No denomination	−0.176**	−0.033	−0.096**	−0.016
Jewish	−0.511***	−0.073	−0.172**	−0.027
Hindu	−0.488***	−0.071	0.036	0.006
Ideology missing	−0.041	−0.008	0.0004	0.0001
Conservative ideology	0.140***	0.028	0.150***	0.027
Has confidence in parliament	0.047	0.009	0.101***	0.018
Trusts most people	0.174***	0.036	0.104***	0.019
Income level 2	0.099**	0.020	0.094***	0.017
Income level 3	0.133**	0.028	0.147***	0.028
Income level 4	0.269***	0.059	0.258***	0.051
Income level 5	0.339***	0.077	0.321***	0.065
Income level 6	0.468***	0.113	0.409***	0.087
Income level 7	0.550***	0.138	0.477***	0.106
Income level 8	0.574***	0.148	0.473***	0.106
Income level 9	0.649***	0.174	0.515***	0.119
Income level 10 (highest)	0.735***	0.203	0.559***	0.132
Age 25–34	−0.092***	−0.018	−0.134***	−0.022
Age 35–44	−0.145***	−0.027	−0.212***	−0.034
Age 45–54	−0.170***	−0.031	−0.269***	−0.042
Age 55–64	−0.076*	−0.014	−0.168***	−0.027
Age > 64	0.106*	0.022	−0.042	−0.007
Male	−0.039**	−0.008	−0.047***	−0.008
Completed primary education	0.021	0.004	0.016	0.003
Incomplete sec., techn.	0.071	0.014	0.068	0.012
Complete sec., techn.	−0.032	−0.006	0.015	0.003
Incomplete sec., uni prep	0.062	0.013	0.016	0.003
Complete sec., uni prep	−0.033	−0.006	0.043	0.008
Lower-level tertiary edu	0.107	0.022	0.016	0.003
Upper-level tertiary edu	0.020	0.004	0.080*	0.015
Single female	−0.151***	−0.027	−0.042	−0.007
Single male	−0.139***	−0.025	−0.059	−0.010
Married	0.053*	0.010	0.157***	0.027
Cohabiting	0.138**	0.029	0.182***	0.036
Has had 1 child	−0.067**	−0.013	−0.055**	−0.009
Has had 2 children	−0.052*	−0.010	−0.037	−0.006
Has had 3 or more children	−0.022	−0.004	−0.017	−0.003
Selfemployed	−0.062	−0.012	−0.020	−0.003
Housewife	0.094*	0.019	0.011	0.002
Retired	−0.056	−0.011	−0.048	−0.008
Other	−0.139**	−0.025	−0.034	−0.006
Student	−0.001	−0.0002	0.032	0.006

Table 2 continued

	Micro model		Reduced model	
	Coefficient	mfx	Coefficient	mfx
Unemployed	−0.310***	−0.052	−0.258***	−0.040
Service part.: > once a week	0.098	0.020	0.182***	0.035
Service part.: once a week	0.066	0.013	0.127***	0.024
Service part.: one a month	0.046	0.009	0.077***	0.014
Service part.: on common holy day	−0.028	−0.005	0.075***	0.014
Service part.: on specific holy day	−0.011	−0.002	0.053	0.010
Service part.: once a year	0.007	0.001	0.026	0.005
Service part.: less than once a year	−0.046	−0.009	0.0003	0.0001
Believes in superior being	0.032	0.006	−0.014	−0.002
Aggregate variables				
Infant mortality			−0.006**	−0.001
Years of independence			−0.0001**	−0.00002
Share of Catholics			0.004***	0.001
Share of Protestants			0.004***	0.001
Bicameral system			0.080*	0.014
Openness			0.001***	0.0002
Investment price			0.420***	0.074
Postcommuist			−0.285***	−0.047
Asia			−0.059	−0.010
Latin America			0.295***	0.059
Africa			−0.319	−0.047
Middle East and North Africa			−0.303**	−0.045
Observations	96092		87748	
Countries	78		70	
Pseudo R2	0.03		0.06	

Note: Ordered probit regression with clustering at the country level. mfx shows marginal effects evaluated at the means of the independent variables
* denotes significant at 10% level;
** significant at 5% level;
*** significant at 1% level

income trajectory), which—when the societal and personal costs of such a change become eminent—are (partly or fully) disappointed.

A bicameral parliament is also associated with higher levels of life satisfaction (contradicting hypothesis 6). Bicameral systems provide veto options which help sustain the status quo and block political and social reforms ('status quo bias'). Obviously, individuals at large disfavor change and prefer stable political and economic situations.[34] Life satisfaction decreases with higher rates of infant mortality, a measure of public health (hypothesis 23). The results of the baseline model equally show that religious denominations are important for well-being, with the share of Protestants and Catholics being significantly associated with higher self-reported individual life satisfaction. As a possible

[34] "For the initiator [of a new system] has the enmity of all who would profit by the preservation of the old institution and merely lukewarm defenders in those who would gain by the new ones," Machiavelli, The Prince, 1513, cited in Feinberg (2006).

interpretation of this result, dominating religions in society shape an individual's assessments, perceptions and expectations of life satisfaction. Similarly, people living in Latin America are significantly happier, while persons in the Middle East and North Africa report systematically lower satisfaction with their lives. The geographical variables are jointly significant at the one percent level.

Regarding the quantitative impact of the aggregate variables, the marginal effects ("mfx") evaluated at the means of the independent variables show that a communist past reduces the probability of reporting the highest life satisfaction level by 5 percentage points. An increase in the relative investment price level by one point increases satisfaction by 0.07. A second chamber also exerts a strong impact while the remaining marginal effects are comparably small. One additional year of independence reduces well-being by −0.00002. Hence, 2000 years of independence would lead to a decrease in the probability of reporting the highest satisfaction category by just 0.04 percentage points.

Finally, comparing the full set of aggregate variables listed in Table 1 with the resulting baseline model in Table 2 shows that many variables suggested to be important determinants of life satisfaction in the previous literature do not survive the general-to-specific procedure. In particular, a set of welfare state characteristics—some of them strongly advocated by Layard (2006), e.g.,—such as gender equality, education, transfer payments, and progressivity of the tax system, but also other macro-level variables like government consumption, national income, income inequality, unemployment, and inflation, as well as institutional characteristics of modern states—democracy and good governance—fail to be significant according to this exercise.

The remainder of this section is organized according to the groups of variables introduced above. We start with discussing the impact of political variables. Economic, institutional, and cultural/human developmental determinants follow. The effects of all these determinants are analyzed for the whole sample and the subpopulations.

In each of the output tables which follow, we report for each variable the coefficient, significance level and the corresponding marginal effect in the ordered probit regression (columns 1 and 2). Regarding the EBA, we present the results for the one variable that enters the F-vector for the robustness test by varying two out of 42 other aggregate variables in the Z-vector, finally generating 800 regressions for each determinant. The reported statistics include the lower and upper bound for the tested variable (columns 3 and 4), the percentage of significant coefficients for the variable of interest in these 800 regressions (at the 5% level) (column 5), the percentage of the cumulative distribution function lying on one side of zero (CDF(0)) (column 6), and, finally the average beta coefficient of the tested variable and the average of the corresponding standard deviation (columns 7 and 8). These statistics are reported not only for the additional variables entering the model one at the time (F), but also for all variables in the baseline model (M).

The quantitative values of the beta coefficients and their standard deviations have to be interpreted with caution, as they refer to all (converging) regressions, including those resulting in insignificant coefficients also. Still, it is instructive to

compare these coefficients with those of the individual regression results. The final assessment will be based on the CDF(0). Following Sala-i-Martin (1997), a variable is considered to be robust if the CDF(0) exceeds 0.90.

4.1 Political variables

Table 3 presents the results for the political variables. As can be seen, for the full sample, the impact of the three political baseline variables is clearly confirmed by the EBA. The CDF(0) of bicameral parliaments, years of independence, and postcommunism clearly exceeds 0.90, with average beta coefficients corresponding to the individual estimates. Equally important for the validity of the general-to-specific results, both the EBA and the individual ordered probit regressions show that all other potential aggregate political determinants do not pass the robustness test and are thus correctly excluded from the baseline model.

Turning to the empirical results for the sub-samples by income, gender or political orientation, Table 3 clearly shows that there are some differences in the political determinants of life satisfaction between the various societal groups across countries. However, the results also show that the baseline model fits the data very well for all groups. With only one exception, our three baseline variables pass the robustness test. The exception is the high income group, where only the post communist dummy is robustly (and negatively) related to well-being. Possibly, people with high income can insure themselves against potential economic shocks that usually parallel fights for independence and political reforms. Furthermore, social elites tend to 'survive' changes in the political system and are thus comparably less affected than other social groups whose relative socio-economic position is more unstable.

Regarding our subsamples, for men and women, as well as people with middle and high income, the additional political variables remain insignificant. However, there are four exceptions: First, people with left-wing ideology are happier in older democracies ('democratic legacy'). Second, people with right-wing ideology are less happy in monarchies, while they are, third, happier with more fractionalized governments. The latter is also true, fourth, for people with low income. As one explanation, fractionalized governments are more likely to pursue pro-poor policies as parties have to compete harder for the median voter, so such governments are less likely to engage in strongly ideological policies. Alternatively, fractionalized governments might induce some political stability by being less able to make sweeping reforms.

Turning to the marginal effects of the political variables on life satisfaction, the results show that the impact of years of independence is of similar small magnitude across the subsamples. Living in a postcommunist country is detrimental to life satisfaction to all societal groups, but the effect appears to be larger for women and people with low and middle income, and smaller for people with high income. It might well be that these three groups are those which had originally most profited from the communist ideology of an equal

Table 3 Political determinants of life satisfaction

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Full sample								
Baseline								
Bicameral parliament	0.080*	0.014	−0.08	0.24	0.74	0.95	0.08	0.05
Years of independence	0.0001**	−2.42E−05	−0.0003	4.71E−05	0.98	0.98	−0.0001	0.001
Postcommunism, dummy	−0.285***	−0.047	−0.61	0.10	0.99	1.00	−0.28	0.09
Additional								
Government fractionalization	0.048	0.009	−0.31	0.35	0.00	0.63	0.03	0.10
Political ideology, 10-year	0.011	0.002	−0.19	0.19	0.00	0.56	0.01	0.05
Political ideology, current	0.024	0.004	−0.17	0.22	0.00	0.62	0.02	0.05
Democracy, Gastil index	0.009	0.002	−0.11	0.14	0.00	0.59	0.01	0.03
Democracy, Polity IV	−0.005	−0.001	−0.03	0.04	0.00	0.65	−0.003	9.01
Democratic legacy	0.001	0.0002	−0.01	0.02	0.00	0.68	0.002	0.004
Monarchy	−0.039	−0.007	−0.19	0.12	0.00	0.78	−0.04	0.05
Male								
Baseline								
Bicameral parliament	0.081*	0.014	−0.09	0.25	0.71	0.94	0.09	0.05
Years of independence	−0.0001***	−2.29E−05	−0.0003	3.64E−05	0.99	0.99	−0.0001	0.00
Postcommunism, dummy	−0.272***	−0.042	−0.61	0.12	0.98	0.99	−0.27	0.09
Additional								
Government fractionalization	0.097	0.016	−0.27	0.40	0.01	0.75	0.07	0.10
Political ideology, 10-year	0.006	0.001	−0.18	0.19	0.00	0.55	0.01	0.04
Political ideology, current	0.018	0.003	−0.18	0.22	0.00	0.59	0.01	0.05
Democracy, Gastil index	0.024	0.004	−0.12	0.13	0.00	0.76	0.02	0.03
Democracy, Polity IV	−0.008	−0.001	−0.04	0.03	0.01	0.73	−0.01	882.01
Democratic legacy	−0.001	−0.0001	−0.01	0.02	0.00	0.57	0.001	0.004
Monarchy	−0.062	−0.010	−0.22	0.10	0.04	0.86	−0.06	0.05

Table 3 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Female								
Baseline								
Bicameral parliament	0.076	0.014	−0.09	0.24	0.46	0.94	0.08	0.05
Years of independence	−0.0001*	−2.41E−05	−0.0003	8.09E−05	0.69	0.95	−0.0001	0.0001
Postcommunism, dummy	−0.306***	−0.052	−0.63	0.10	1.00	1.00	−0.30	0.10
Additional								
Government fractionalization	−0.004	−0.001	−0.36	0.32	0.00	0.53	−0.01	0.10
Political ideology, 10-year	0.016	0.003	−0.18	0.20	0.00	0.58	0.01	0.05
Political ideology, current	0.027	0.005	−0.17	0.21	0.00	0.61	0.01	0.05
Democracy, Gastil index	−0.004	−0.001	−0.12	0.15	0.00	0.59	−0.01	0.03
Democracy, Polity IV	−0.002	−0.0003	−0.03	0.04	0.00	0.55	−0.001	2.01
Democratic legacy	0.003	0.001	−0.01	0.02	0.00	0.76	0.003	0.004
Monarchy	−0.017	−0.003	−0.20	0.14	0.00	0.65	−0.02	0.06
Left								
Baseline								
Bicameral parliament	0.090**	0.015	−0.07	0.23	0.91	0.97	0.09	0.05
Years of independence	−0.0002***	−3.36E−05	−0.0004	−0.0001	1.00	1.00	−0.0002	4.57E−05
Postcommunism, dummy	−0.267***	−0.041	−0.4992	0.23	0.90	0.98	−0.23	0.08
Additional								
Government fractionalization	0.048	0.008	−0.24	0.32	0.00	0.77	0.06	0.08
Political ideology, 10-year	0.012	0.002	−0.13	0.16	0.00	0.50	−0.0002	0.04
Political ideology, current	−0.004	−0.001	−0.19	0.13	0.00	0.66	−0.02	0.04
Democracy, Gastil index	−0.009	−0.002	−0.10	0.11	0.00	0.60	−0.01	0.02
Democracy, Polity IV	0.007	−0.001	−0.02	0.04	0.01	0.82	−0.01	0.01
Democratic legacy	0.006**	0.001	−0.01	0.02	0.61	0.95	0.01	0.003
Monarchy	−0.050	−0.008	−0.22	0.08	0.04	0.87	−0.05	0.05

Table 3 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Right								
Baseline								
Bicameral parliament	0.084	0.17	−0.11	0.24	0.47	0.92	0.08	0.05
Years of independence	−0.0002**	−2.98E−05	−0.0004	0.0001	0.76	0.96	−0.0001	0.0001
Postcommunism, dummy	−0.235***	−0.045	−0.5960	0.32	0.83	0.97	−0.22	0.10
Additional								
Government fractionalization	0.195*	0.040	−0.19	0.50	0.53	0.94	0.17	0.10
Political ideology, 10-year	−0.008	−0.002	−0.21	0.22	0.00	0.52	0.00	0.05
Political ideology, current	0.002	0.001	−0.20	0.18	0.00	0.51	−0.001	0.05
Democracy, Gastil index	0.028	0.006	−0.14	0.15	0.04	0.78	0.02	0.03
Democracy, Polity IV	−0.009	−0.002	−0.03	0.02	0.16	0.79	−0.01	0.01
Democratic legacy	−0.003	0.001	−0.01	0.01	0.01	0.65	−0.002	0.004
Monarchy	−0.104*	−0.020	−0.29	0.08	0.46	0.94	−0.10	0.06
Low income								
Baseline								
Bicameral parliament	0.141***	0.024	−0.02	0.31	1.00	1.00	0.14	0.05
Years of independence	−0.0002***	−2.79E−05	−0.0003	1.74E−05	1.00	1.00	−0.0002	0.0001
Postcommunism, dummy	−0.389***	−0.061	−0.69	0.06	1.00	1.00	−0.36	0.10
Additional								
Government Fractionalization	0.197**	0.034	−0.21	0.48	0.62	0.94	0.17	0.10
Political ideology, 10-year	0.043	0.008	−0.15	0.20	0.00	0.73	0.03	0.05
Political ideology, current	0.051	0.009	−0.18	0.22	0.00	0.73	0.04	0.06
Democracy, Gastil index	0.003	0.001	−0.12	0.14	0.00	0.53	0.002	0.03
Democracy, Polity IV	−0.005	−0.001	−0.04	0.03	0.00	0.68	−0.004	0.01
Democratic legacy	0.001	0.0002	−0.01	0.02	0.00	0.65	0.002	0.004
Monarchy	−0.037	−0.0002	−0.19	0.16	0.00	0.71	−0.03	0.06

Table 3 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Middle income								
Baseline								
Bicameral parliament	−0.101**	−0.017	−0.10	−0.28	0.81	0.96	−0.10	0.05
Years of independence	−0.0002***	−3.88E−05	−0.0005	4.06E−06	1.00	1.00	−0.0002	7.78E−05
Postcommunism, dummy	−0.335***	−0.053	−0.80	−0.11	0.99	1.00	−0.32	0.11
Additional								
Government fractionalization	0.029	0.005	−0.40	0.39	0.00	0.54	0.01	0.12
Political ideology, 10-year	−0.004	−0.001	−0.22	0.24	0.00	0.53	−0.003	0.05
Political ideology, current	−0.001	−0.0002	−0.23	0.23	0.00	0.54	−0.01	0.06
Democracy, Gastil index	0.018	0.003	−0.14	0.15	0.00	0.69	0.01	0.03
Democracy, Polity IV	−0.010	−0.002	−0.04	0.03	0.10	0.83	−0.01	0.01
Democratic legacy	−0.002	−0.0003	−0.02	0.01	0.00	0.56	−0.001	0.005
Monarchy	−0.001	−0.0002	−0.19	0.23	0.00	0.51	0.002	0.07
High income								
Baseline								
Bicameral parliament	0.054	0.010	−0.14	0.27	0.03	0.82	0.06	0.06
Years of independence	−0.0001	−2.05E−05	−0.0003	0.0001	0.07	0.89	−0.0001	0.0001
Postcommunism, dummy	−0.236*	−0.043	−0.68	0.35	0.68	0.95	−0.23	0.12
Additional								
Government fractionalization	0.059	0.011	−0.38	0.53	0.00	0.65	0.05	0.12
Political ideology, 10-year	−0.012	−0.002	−0.19	0.22	0.00	0.53	−0.003	0.05
Political ideology, current	−0.024	−0.005	−0.25	0.20	0.01	0.66	−0.03	0.06
Democracy, Gastil index	0.018	0.003	−0.19	0.16	0.02	0.66	0.01	0.03
Democracy, Polity IV	−0.005	−0.001	−0.05	0.04	0.00	0.58	−0.002	0.01
Democratic legacy	0.004	0.001	−0.01	0.03	0.18	0.88	0.01	0.004
Monarchy	0.029	−0.005	−0.21	0.16	0.00	0.68	−0.03	0.06

Note: Individual level determinants and area dummies are included but not reported;
* denotes significant at 10% level;
** significant at 5% level;
*** significant at 1% level

share of the 'cake' for all societal groups, while high income earners are possibly those with the strongest comparative advantage in an open market society.

The marginal effects also indicate that the impact of bicameral systems is particularly strong for persons in the lower income group. Possibly, policies in certain countries in the late 1990s[35] which particularly entailed cuts in the welfare and pension system might have occurred to a lesser extent in countries with a strong institutional veto player, favoring the status quo and thus favoring people with low income. While this may simply be due to this income group valuing stability higher due to fluctuations having larger relative impacts on them, it may also partly stem from historical institutional differences as many bicameral systems were supplanted by the British colonial administration, which was known to be more lenient than that of other countries (cf. Ferguson 2004).

As stated before, according to the results, most of the additional political variables are clearly not robustly related to well-being in any of our sub-samples. For example, various measures of democratic institutions such as democratic legacy, the Gastil index and the Polity IV index, exert no significant effect on individual life satisfaction. The importance of this finding should not be understated as there is an ongoing dispute on whether or not democracy affects individual well-being (Frey and Stutzer 2002; Dorn et al. 2006). Similarly, governments' political ideologies do not appear to be influential, which might indicate that, in general, ideology and its induced policy changes are in line with the average citizen's preferences, both in the short-run ('current political ideology') as well as over a time span of ten years ('political ideology, 10-year'). This result confirms the finding of Bjørnskov et al. (2007), in which government ideology was only important in its interplay with government spending, but not on its own.

4.2 Economic factors

Table 4 presents the results for the economic factors. As can be seen from columns 1 and 6 in the table, the two baseline variables are robustly related to life satisfaction in the full sample and all subgroups—openness to trade and the investment price level clearly increase well-being. Also, the coefficients of the variables obtained from the individual regressions again closely match the average coefficients based on the more than 800 regressions of the EBA. The results show that a higher investment price—indicating a 'friendly' business climate—is beneficial for all societal groups, but, as the marginal effect shows, left-wing voters enjoy the highest gains, closely followed by people with middle income.

Turning to the additional economic variables, only two of them pass the robustness test in the full sample. According to the results of the EBA, well-being robustly increases with higher subsidies and higher marginal tax rates, lending support to our hypothesis 14 according to which redistribution is con-

[35] The surveys were carried out in 1996–1997 for some countries, but for most of the countries in 1999–2000.

Table 4 Economic determinants of life satisfaction

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Full sample								
Baseline								
Openness to trade	0.001***	0.0002	−0.0007	0.003	0.98	0.99	0.001	0.0005
Investment price	0.420***	0.074	0.02	0.71	1.00	1.00	0.41	0.11
Additional								
Average tariff rate	−0.003	−0.001	−0.03	0.01	0.00	0.75	−0.004	0.01
Income inequality	2.21E−05	4.08E−06	−0.0001	0.0001	0.04	0.76	2.67E−05	3.54E−05
GDP per capita	0.068	0.012	−0.22	0.40	0.09	0.84	0.08	0.08
Government consumption	−0.003	−0.001	−0.02	0.01	0.01	0.81	−0.003	0.003
Inflation	−0.0003	−5.02E−05	−0.002	0.002	0.00	0.66	−0.0002	0.0005
Unemployment	−0.002	−0.0003	−0.03	0.02	0.00	0.68	−0.003	0.01
Globalization index, 1995	−0.015	−0.003	−0.14	0.11	0.00	0.64	−0.01	0.03
Compound growth, 5-years	−0.208	−0.037	−0.94	0.72	0.07	0.81	−0.22	0.23
Growth stability	0.038	0.007	−5.70	4.87	0.00	0.50	−0.04	1.32
Subsidies	0.004**	0.001	−0.002	0.01	0.95	0.98	0.003	0.002
Top marginal tax rate	0.003	0.001	−0.004	0.01	0.20	0.92	0.003	0.002
Public debt, % of GDP	−0.001	−0.0001	−0.004	0.002	0.04	0.85	−0.001	0.001
Access to technology	0.0002	3.31E−05	−0.001	0.002	0.01	0.70	0.0002	0.0004
Male								
Baseline								
Openness to trade	0.001***	0.0002	−0.001	0.003	0.92	0.98	0.001	0.00
Investment price	0.472***	0.079	0.08	0.79	1.00	1.00	0.46	0.10
Additional								
Average tariff rate	−0.002	−0.0004	−0.02	0.01	0.00	0.70	−0.003	0.01
Income inequality	2.65E−05	1.00E−05	−0.0001	0.0002	0.05	0.77	2.92E−05	3.68E−05
GDP per capita	0.058	0.010	−0.22	0.40	0.08	0.82	0.08	0.08
Government consumption	−0.004	−0.001	−0.02	0.01	0.04	0.86	−0.004	0.003
Inflation	−0.0001	−1.67E−05	−0.002	0.002	0.00	0.57	−0.0001	0.0004
Unemployment	−0.003	−0.001	−0.03	0.02	0.00	0.74	−0.003	0.01

Table 4 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Globalization index, 1995	−0.010	−0.002	−0.13	0.10	0.00	0.57	−0.01	0.03
Compound growth, 5-years	−0.137	0.023	−0.94	0.78	0.01	0.72	−0.15	0.24
Growth stability	0.544	0.093	−5.78	4.84	0.00	0.59	0.29	1.35
Subsidies	0.003**	0.001	−0.002	0.01	0.92	0.98	0.003	0.002
Top marginal tax rate	0.003	0.001	−0.01	0.01	0.09	0.88	0.003	0.003
Public debt, % of GDP	−0.001	−0.0001	−0.003	0.002	0.07	0.84	−0.0008	0.0008
Access to technology	−6.27E−06	−1.05E−06	−0.002	0.001	0.01	0.55	0.0001	0.0004
Female								
Baseline								
Openness to trade	0.001***	0.0002	−0.0007	0.003	0.99	0.99	0.001	0.0005
Investment price	0.367***	0.067	−0.04	0.70	1.00	1.00	0.36	0.12
Additional								
Average tariff rate	−0.004	−0.001	−0.03	0.01	0.00	0.79	−0.005	0.01
Income inequality	1.73E−05	3.33E−06	−0.0001	0.0001	0.04	0.72	2.27E−05	3.66E−05
GDP per capita	0.074	0.014	−0.23	0.41	0.07	0.83	0.08	0.08
Government consumption	−0.003	−0.001	−0.02	0.01	0.00	0.75	−0.003	0.004
Inflation	−0.001	−0.0001	−0.002	0.002	0.00	0.73	−0.0003	0.0005
Unemployment	−0.001	−0.0003	−0.03	0.01	0.01	0.65	−0.003	0.01
Globalization index, 1995	−0.021	−0.004	−0.16	0.11	0.00	0.70	−0.02	0.03
Compound growth, 5-years	−0.240	−0.045	−0.93	0.70	0.09	0.83	−0.24	0.23
Growth stability	−0.342	−0.065	−5.67	5.09	0.00	0.56	−0.26	1.37
Subsidies	0.004**	0.001	−0.002	0.01	0.89	0.97	0.004	0.002
Top marginal tax rate	0.003	0.001	−0.004	0.01	0.25	0.93	0.004	0.002
Public debt, % of GDP	−0.001	−0.0002	−0.004	0.002	0.03	0.85	−0.001	0.001
Access to technology	0.0004	0.0001	−0.001	0.002	0.04	0.81	0.0004	0.0004
Left								
Baseline								
Openness to trade	0.001**	0.0002	0.0008	0.003	0.93	0.98	0.001	0.0006
Investment price	0.577***	0.093	0.29	0.84	1.00	1.00	0.57	0.07

Table 4 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Additional								
Average tariff rate	−0.005	−0.001	−0.02	0.01	0.02	0.85	−0.005	0.005
Income inequality	1.92E−05	3.25E−06	−0.0001	0.0001	0.07	0.79	2.86E−05	3.24E−05
GDP per capita	0.167***	0.027	−0.12	0.44	0.96	0.99	0.17	0.07
Government consumption	−0.008***	−0.001	−0.02	0.002	1.00	0.99	−0.01	0.003
Inflation	−0.001	−0.0001	−0.002	0.001	0.13	0.87	−0.001	0.0005
Unemployment	−0.006	−0.001	−0.03	0.01	0.38	0.93	−0.01	0.004
Globalization index, 1995	−0.018	−0.003	−0.13	0.13	0.00	0.60	−0.01	0.03
Compound growth, 5-years	−0.029	−0.005	−0.73	0.81	0.00	0.55	−0.03	0.23
Growth stability	−0.690	−0.115	−6.30	2.68	0.04	0.74	−0.83	1.19
Subsidies	0.002	0.0004	−0.003	0.01	0.13	0.90	0.002	0.002
Top marginal tax rate	0.003	0.0001	−0.003	0.01	0.20	0.92	0.003	0.002
Public debt, % of GDP	−0.001	−0.0001	−0.003	0.002	0.01	0.83	−0.0007	0.0007
Access to technology	0.001**	0.0001	−0.0007	0.002	0.59	0.93	0.0005	0.0003
Right								
Baseline								
Openness to trade	0.001**	0.0003	−0.001	0.004	0.82	0.96	0.001	0.001
Investment price	0.372***	0.076	−0.06	0.76	1.00	1.00	0.37	0.12
Additional								
Average tariff rate	−0.004	−0.001	−0.02	0.01	0.02	0.77	−0.004	0.005
Income inequality	−1.78E−05	−3.75E−06	−0.0002	0.0001	0.01	0.68	−2.06E−05	3.99E−05
GDP per capita	0.077	0.016	−0.18	0.52	0.41	0.90	0.13	0.08
Government consumption	−0.008*	−0.002	−0.03	0.005	0.86	0.97	0.01	0.004
Inflation	−4.02E−05	−8.25E−06	−0.002	0.002	0.00	0.52	−2.34E−05	0.0004
Unemployment	−0.008*	−0.002	−0.04	0.01	0.68	0.95	−0.01	0.01
Globalization index, 1995	0.040*	0.009	−0.11	0.15	0.43	0.90	0.04	0.03
Compound growth, 5-years	−0.208	−0.043	−0.98	0.64	0.07	0.81	−0.22	0.23
Growth stability	0.400	0.084	−5.54	4.48	0.00	0.53	0.07	1.32

Table 4 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Subsidies	0.004**	0.001	−0.002	0.01	0.98	0.99	0.004	0.002
Top marginal tax rate	0.002	0.001	−0.01	0.01	0.01	0.76	0.002	0.003
Public debt, % of GDP	−0.0001	−1.41E−05	−0.004	0.003	0.00	0.58	−0.0002	0.001
Access to technology	−0.0001	−0.0002	−0.002	0.001	0.03	0.53	−4.28E−05	0.0004
Low income								
Baseline								
Openness to trade	0.002***	0.0003	−0.001	0.004	0.95	0.99	0.001	0.001
Investment price	0.499***	0.086	0.10	0.82	1.00	1.00	0.49	0.11
Additional								
Average tariff rate	−0.005	−0.001	−0.03	0.01	0.01	0.83	−0.01	0.01
Income inequality	1.54E−05	2.78E−06	−0.0001	0.0002	0.03	0.71	2.50E−05	4.05E−05
GDP per capita	0.084	0.014	−0.20	0.45	0.13	0.88	0.10	0.08
Government consumption	−0.006*	−0.001	−0.02	0.004	0.74	0.96	−0.01	0.003
Inflation	−0.001	−0.0001	−0.002	0.002	0.01	0.80	−0.005	0.0006
Unemployment	−0.006	−0.001	−0.03	0.02	0.14	0.86	−0.01	0.01
Globalization index, 1995	0.024	0.005	−0.12	0.16	0.04	0.75	0.02	0.03
Compound growth, 5-years	−0.233	−0.041	−0.97	0.72	0.06	0.82	−0.23	0.24
Growth stability	−0.338	−0.061	−6.36	3.61	0.00	0.59	−0.38	1.39
Subsidies	0.002	0.0003	−0.004	0.01	0.07	0.82	0.002	0.002
Top marginal tax rate	0.003	0.001	−0.004	0.01	0.10	0.86	0.003	0.03
Public debt, % of GDP	−0.001	−0.0001	−0.004	0.002	0.03	0.82	−0.0008	0.0009
Access to technology	0.0002	0.0004	−0.002	0.002	0.04	0.70	0.0003	0.0005
Middle income								
Baseline								
Openness to trade	0.001**	0.0002	−0.001	0.003	0.63	0.95	0.001	0.0006
Investment price	0.552***	0.096	0.01	0.91	1.00	1.00	0.51	0.13
Additional								
Average tariff rate	−0.003	−0.001	−0.03	0.00	0.00	0.69	−0.004	0.01
Income inequality	1.36E−05	2.50E−06	−0.0001	0.00	0.01	0.65	1.80E−05	4.18E−05
GDP per capita	0.081	0.014	−0.25	0.45	0.21	0.87	0.10	0.08

Table 4 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Government consumption	−0.007*	−0.001	−0.02	0.005	0.80	0.96	−0.01	0.004
Inflation	−0.0001	−1.00E−05	−0.002	0.003	0.00	0.51	4.07E−05	0.001
Unemployment	−0.003	−0.001	−0.04	0.01	0.01	0.75	−0.005	0.01
Globalization index, 1995	−0.008	−0.001	−0.14	0.17	0.00	0.53	0.005	0.04
Compound growth, 5-years	−0.366	−0.064	−1.45	0.60	0.33	0.92	−0.42	0.27
Growth stability	1.069	0.191	−6.15	6.99	0.00	0.69	0.95	1.73
Subsidies	0.004**	0.001	−0.003	0.01	0.80	0.97	0.004	0.002
Top marginal tax rate	0.005*	0.001	−0.003	0.02	0.63	0.95	0.005	0.003
Public debt, % of GDP	−0.001	−0.0002	−0.004	0.002	0.08	0.86	−0.001	0.001
Access to technology	0.0003	0.0001	−0.002	0.002	0.13	0.80	0.0004	0.0004
High income								
Baseline								
Openness to trade	0.001**	0.0002	−0.0008	0.004	0.91	0.98	0.001	0.0005
Investment price	0.353**	0.068	−0.18	0.83	0.90	0.98	0.30	0.14
Additional								
Average tariff rate	0.0002	0.0001	−0.02	0.02	0.00	0.52	−0.0002	0.01
Income inequality	9.72E−06	1.95E−06	−0.001	0.0002	0.04	0.65	1.92E−05	4.57E−05
GDP per capita	0.006	0.001	−0.31	0.47	0.01	0.58	0.02	0.09
Government consumption	−0.004	−0.001	−0.02	0.01	0.01	0.82	−0.004	0.004
Inflation	0.0003	0.0001	−0.001	0.003	0.12	0.76	0.0004	0.0005
Unemployment	0.002	0.001	−0.03	0.02	0.00	0.55	0.0002	0.01
Globalization index, 1995	−0.063	−0.012	−0.17	0.10	0.27	0.84	−0.05	0.04
Compound growth, 5-years	−0.219	−0.042	−1.09	0.74	0.05	0.79	−0.23	0.26
Growth stability	1.202	0.236	−5.84	7.71	0.01	0.68	0.94	1.73
Subsidies	0.002	0.0004	−0.004	0.01	0.02	0.85	0.002	0.002
Top marginal tax rate	0.004	0.001	−0.01	0.02	0.18	0.89	0.003	0.002
Public debt, % of GDP	−0.002*	−0.0003	−0.01	0.001	0.58	0.95	−0.002	0.001
Access to technology	0.0001	1.41E−05	−0.001	0.002	0.06	0.67	0.0002	0.0004

Note: Individual level determinants and area dummies are included but not reported; * denotes significantly at 10% level; ** significant at 5% level; *** significant at 1% level

ducive to life satisfaction. The same pattern prevails in the female, left, and middle income samples, while subsidies also robustly increase the well-being of male and right-wing people. As one explanation, obviously, particularly women, people with middle income and left-wing voters appear to be in favor of income redistribution through the tax system, which might represent those groups whose income is more subject to fluctuations. Subsidizing the domestic industry might well help to create and maintain those jobs that are usually mostly occupied by middle income earners (reflecting an average level of education), but does not significantly affect employment opportunities of low skilled and very highly skilled workers, represented by the corresponding income groups. The positive impact of subsidies on right-wing voters is noteworthy given the fact that strong government involvement is commonly associated with a typically leftist view. The marginal effects imply that actual subsidy levels are more in line with conservative voters' preferences, but possibly too low to exert a decisively beneficial impact on leftist-oriented persons.

Higher per capita GDP robustly increases life satisfaction in the left-wing and right-wing samples, potentially proxying greater consumption possibilities (in line with hypothesis 9). In contrast, more government consumption robustly decreases life satisfaction in the left-wing and right-wing samples and the low and middle income groups. The detrimental influence of government consumption supports previous findings reported in Bjørnskov et al. (2007) and lends support to hypothesis 12.[36] The marginal effects, however, imply that right-wing voters are twice as negatively affected by government spending compared to left-wing voters, which supports the traditional view that government interventions are more favored by leftist ideologies.[37] As regards personal income, it is possible that people with high incomes are systematically less affected by government consumption decisions because a relatively larger share of their income remains when subtracting fixed costs of housing, food, etc.

In the left-wing sample solely, moreover, people report robustly greater satisfaction with their lives with lower unemployment and better access to technology. While the result for unemployment is intuitive and in support of hypothesis 18, easier access to modern technology might to some extent proxy economic development and prosperity. The result would thus correspond to the positive effect of GDP per capita for the identical population group, but equally mirror the impact of unemployment and large-scale redistribution via subsidies and the tax system, which left-wing voters arguably care more about than right-wing voters.

People in the right-wing sample are similarly unhappy with rising unemployment, while their well-being increases with greater globalization. Thus

[36] This result might be due to reverse causality, as 'unhappier' countries having greater problems might require larger government sectors. Bjørnskov et al. (2007) test for reversed causality and find this to be no significant problem.

[37] In contrast, right-wing government ideology mitigates the detrimental impact of government consumption spending (Bjørnskov et al. 2007). This result shows the importance of distinguishing between individual ideology and government ideology, which would be suppressed in a purely aggregate analysis.

right-wing oriented persons appear more satisfied with their lives in economies which are more exposed to globalization than in more isolated countries, an effect going beyond that of openness to trade. Arguably, people with more left-wing ideology might frequently be more in favor of restrictions and fear more globalization to come at the expense of social peace through its impacts on social welfare and wage distribution. For right-wing persons, the marginal effects of the unemployment rate are twice as large as those for the left-wing group. Unemployment rates (as a measure of business climate) might well serve as a performance indicator of the ruling government, particularly in economically difficult times, and the smaller effect in the left-wing group might be caused by the fact that the value system of right-wing voters implies a greater importance of unemployment rates relative to, e.g., distributional concerns.

Finally, public debt reduces well-being of high income people solely, which may reflect that this income group is unlikely to gain from the public activities financed by debt accumulation while bearing major parts of the (tax) burden coming with repayment. Surprisingly, economic growth reduces well-being of people with middle income.

Among those economic determinants not robustly related to life satisfaction in any sample are the average tariff rate, inflation, growth stability, and income inequality. The first factor might be well disguised by the openness to trade measure, while the insignificance of income inequality might well indicate that people care less about the resulting income distribution in society than actual efforts by the government to redistribute, although often constituting only some type of symbolic policy-making.[38] Furthermore, it might well be that not a sufficiently large number of countries suffer from inflation or growth instability sufficiently high to impact subjective well-being significantly.

4.3 Institutional factors

Results for institutional factors are reported in Table 5. The shares of Protestants and Catholics robustly increase well-being in all samples, with a coefficient significant at the 1% level (column 1) and a CDF of 1 in all cases. Again, the positive coefficients of the individual regressions correspond closely to the average coefficient, ranging between 0.003 and 0.005. The marginal effects for both religion variables are similar across regressions, showing all groups to be qualitatively equally affected.

In contrast, most of the additional institutional variables do not exhibit a robust and significant impact on well-being. The major exceptions are the measures of governance and a few religious denominations in some population groups. In particular, legal quality, regulatory quality, and overall governance negatively impact well-being with a CDF(0) > 0.9 in some samples. These results are rather surprising, contradicting our hypothesis 19. In particular, people with

[38] For example, the top marginal tax rate on companies is rarely applied in some countries, and individual high income earners sometimes enjoy a lot of possibilities to substantially reduce their taxable income.

Table 5 Institutional determinants of life satisfaction

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Full sample								
Baseline								
Protestants	0.004***	0.001	0.002	0.01	1.00	1.00	0.004	0.001
Catholics	0.004***	0.001	0.001	0.01	1.00	1.00	0.003	0.001
Additional								
Governance	−0.037	−0.007	−0.37	0.27	0.03	0.73	−0.04	0.07
Legal quality	−0.030*	−0.006	−0.10	0.05	0.63	0.95	−0.03	0.02
Regularity quality	−0.018	−0.004	−0.09	0.08	0.11	0.80	−0.02	0.02
Lack of corruption	−0.017	−0.003	−0.12	0.11	0.00	0.74	−0.02	0.02
Press freedom	0.001	0.0001	−0.01	0.01	0.00	0.55	0.0002	0.002
Confidence in parliament	0.009	0.002	−0.37	0.47	0.00	0.59	0.03	0.11
Ethnic diversity	0.128	0.023	−0.30	0.66	0.27	0.88	0.16	0.12
Orthodox	−0.001	−0.0001	−0.004	0.004	0.05	0.70	−0.0005	0.001
Muslims	0.001	0.0002	−0.002	0.01	0.30	0.86	0.001	0.001
Hindi	−0.0004	−6.36E−05	−0.10	0.12	0.05	0.57	0.0003	0.002
Buddhists	−0.001	−0.0002	−0.17	6.28	0.06	0.76	0.03	0.01
Social trust	−0.001	−0.0001	−0.01	0.01	0.01	0.60	−0.001	0.002
Male								
Baseline								
Protestants	0.005***	0.001	0.002	0.01	1.00	1.00	0.005	0.001
Catholics	0.003***	0.001	0.001	0.01	1.00	1.00	0.003	0.001
Additional								
Governance	−0.071	−0.012	−0.40	0.30	0.16	0.83	−0.07	0.07
Legal quality	−0.040**	−0.007	−0.11	0.05	0.89	0.97	−0.04	0.02
Regulatory quality	−0.024	−0.004	−0.10	0.08	0.20	0.84	−0.02	0.02
Lack of corruption	−0.030	−0.005	−0.12	0.11	0.13	0.85	−0.03	0.02
Press freedom	0.002	0.0004	−0.01	0.01	0.05	0.82	0.002	0.002
Confidence in parliament	0.001	0.0001	−0.40	0.53	0.05	0.59	0.04	0.11
Ethnic diversity	0.105	0.018	−0.34	0.64	0.23	0.85	0.14	0.12
Orthodox	−0.001	−0.0001	−0.01	0.004	0.11	0.77	−0.001	0.001

Table 5 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Muslims	0.0004	0.0006	−0.003	0.01	0.16	0.69	0.001	0.001
Hindi	−9.86E−06	−1.66E−06	−0.07	0.16	0.09	0.64	0.001	0.002
Buddhists	−0.003*	−0.001	−0.17	6.06	0.55	0.91	0.03	0.01
Social trust	0.001	0.0001	−0.01	0.01	0.001	0.58	0.0005	0.002
Female								
Baseline								
Protestants	0.004***	0.001	0.001	0.01	1.00	1.00	0.004	0.001
Catholics	0.004***	0.001	0.001	0.01	1.00	1.00	0.004	0.001
Additional								
Governance	−0.003	−0.001	−0.36	0.27	0.01	0.58	−0.02	0.07
Legal quality	−0.0121	−0.004	−0.10	0.05	0.03	0.89	−0.02	0.02
Regulatory quality	−0.013	−0.003	−0.09	0.08	0.00	0.73	−0.01	0.02
Lack of corruption	−0.003	−0.001	−0.11	0.12	0.00	0.57	−0.004	0.02
Press freedom	−0.001	−0.0002	−0.01	0.01	0.00	0.73	−0.001	0.002
Confidence in parliament	0.004	0.001	−0.39	0.41	0.00	0.55	0.02	0.11
Ethnic diversity	0.138	0.025	−0.29	0.69	0.27	0.89	0.18	0.13
Orthodox	−0.001	−0.0001	−0.003	0.004	0.01	0.62	−0.0003	0.001
Muslims	0.002	0.0003	−0.002	0.01	0.41	0.94	0.002	0.001
Hindi	−0.001	−0.0002	−0.14	0.11	0.00	0.57	−0.0003	0.002
Buddhists	6.82E−05	1.25E−05	−0.19	6.72	0.01	0.54	0.03	0.01
Social trust	−0.002	−0.0003	−0.01	0.01	0.00	0.73	−0.001	0.002
Left								
Baseline								
Protestants	0.005***	0.001	0.002	0.01	1.00	1.00	0.005	0.001
Catholics	0.004***	0.001	0.001	0.01	1.00	1.00	0.004	0.001
Additional								
Governance	0.034	0.006	−0.25	0.28	0.00	0.65	0.02	0.06
Legal quality	−0.012	−0.002	−0.08	0.05	0.07	0.83	−0.01	0.01
Regulatory quality	−0.014	−0.003	−0.08	0.06	0.06	0.80	−0.02	0.02
Lack of corruption	0.006	0.001	−0.10	0.09	0.00	0.56	0.003	0.02

Table 5 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Press freedom	−0.002	−0.0002	−0.01	0.01	0.00	0.69	−0.001	0.002
Confidence in parliament	−0.037	−0.006	−0.49	0.30	0.00	0.64	−0.04	0.11
Ethnic diversity	−0.033	−0.005	−0.44	0.47	0.00	0.53	−0.01	0.11
Orthodox	−0.002**	−0.0003	−0.005	0.003	0.57	0.90	−0.001	0.001
Muslims	0.002***	0.0003	−0.001	0.01	0.99	0.99	0.002	0.001
Hindi	0.001	0.0001	−0.08	0.14	0.04	0.68	0.001	0.002
Buddhists	−0.001	−0.0001	−0.01	7.31	0.10	0.70	0.18	0.04
Social trust	−0.001	−0.0001	−0.01	0.01	0.00	0.61	−0.001	0.002
Right								
Baseline								
Protestants	0.005***	0.001	0.002	0.01	1.00	1.00	0.01	0.001
Catholics	0.003***	0.001	−0.0002	0.01	1.00	1.00	0.003	0.001
Additional								
Governance	−0.057	−0.012	−0.39	0.32	0.07	0.77	−0.06	0.07
Legal quality	−0.027	−0.006	−0.11	0.05	0.04	0.84	−0.03	0.02
Regulatory quality	0.009	0.002	−0.10	0.10	0.01	0.62	0.01	0.03
Lack of corruption	−0.023	−0.005	−0.13	0.12	0.04	0.77	−0.02	0.03
Press freedom	0.002	0.001	−0.01	0.01	0.03	0.80	0.002	0.002
Confidence in parliament	−0.010	−0.002	−0.39	0.49	0.11	0.57	0.04	0.10
Ethnic diversity	0.156	0.032	−0.25	0.68	0.51	0.93	0.18	0.10
Orthodox	−0.001	−0.0002	−0.01	0.004	0.05	0.79	−0.001	0.001
Muslims	0.001	0.0001	−0.003	0.01	0.25	0.79	0.001	0.001
Hindi	−0.004	−0.001	−0.45	0.01	0.17	0.83	−0.003	0.003
Buddhists	−0.001	−0.0003	−0.37	6.20	0.07	0.70	0.14	0.04
Social trust	0.003	0.001	−0.01	0.01	0.04	0.83	0.002	0.002
Low income								
Baseline								
Protestants	0.004***	0.001	−0.0002	0.01	1.00	1.00	0.003	0.001
Catholics	0.003***	0.001	−0.001	0.01	1.00	1.00	0.002	0.001

Table 5 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Additional								
Governance	−0.002	−0.0004	−0.40	0.36	0.00	0.56	−0.01	0.08
Legal quality	−0.042**	−0.008	−0.11	0.07	0.94	0.98	−0.04	0.02
Regulatory quality	−0.049*	−0.009	−0.15	0.05	0.90	0.97	−0.05	0.03
Lack of corruption	−0.008	−0.002	−0.14	0.12	0.00	0.63	−0.01	0.03
Press freedom	−2.49E−06	−4.30E−07	−0.01	0.01	0.00	0.51	−0.0001	0.002
Confidence in parliament	−0.002	−0.0003	−0.48	0.48	0.00	0.52	0.01	0.12
Ethnic diversity	0.023	0.004	−0.39	0.66	0.03	0.67	0.07	0.13
Orthodox	−0.001	−0.0002	−0.01	0.004	0.04	0.70	−0.001	0.001
Muslims	0.001	0.0002	−0.002	0.01	0.27	0.89	0.001	0.001
Hindi	0.0001	2.34E−05	−0.09	0.16	0.02	0.63	0.001	0.002
Buddhists	−0.001	−0.0002	−0.24	7.51	0.02	0.71	0.04	0.01
Social trust	0.001	0.0002	−0.01	0.01	0.00	0.64	0.001	0.003
Middle income								
Baseline								
Protestants	0.004***	0.001	0.001	0.01	1.00	1.00	0.004	0.001
Catholics	0.004***	0.001	0.001	0.01	1.00	1.00	0.004	0.001
Additional								
Governance	−0.080	−0.014	−0.44	0.26	0.17	0.87	−0.09	0.07
Legal quality	−0.038*	−0.007	−0.12	0.09	0.50	0.94	−0.04	0.02
Regulatory quality	−0.040	−0.008	−0.16	0.07	0.28	0.92	−0.04	0.03
Lack of corruption	−0.029	−0.005	−0.12	0.12	0.06	0.81	−0.03	0.03
Press freedom	0.001	0.0002	−0.01	0.01	0.00	0.62	0.001	0.002
Confidence in parliament	0.024	0.004	−0.48	0.58	0.00	0.64	0.06	0.13
Ethnic diveristy	0.190	0.033	−0.29	0.84	0.32	0.91	0.22	0.15
Orthodox	−0.0004	−7.65E−05	−0.005	0.01	0.01	0.63	−0.0003	0.001
Muslims	0.001	0.0002	−0.003	0.01	0.28	0.86	0.002	0.001
Hindi	−0.005**	−0.001	−0.14	0.13	0.66	0.95	−0.004	0.003
Buddhists	−0.002	−0.0004	−0.23	9.19	0.16	0.86	0.05	0.01

Table 5 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Social Trust	0.003	0.001	−0.01	0.01	0.01	0.85	0.003	0.003
High income								
Baseline								
Protestants	0.005***	0.001	0.001	0.01	1.00	1.00	0.005	0.001
Catholics	0.005***	0.001	0.002	0.01	1.00	1.00	0.005	0.001
Additional								
Governance	−0.125**	−0.024	−0.49	0.22	0.79	0.96	−0.13	0.07
Legal quality	−0.039	−0.008	−0.16	0.03	0.16	0.91	−0.03	0.02
Regulatory quality	0.016	0.003	−0.06	0.18	0.05	0.73	0.02	0.03
Lack of corruption	−0.036	−0.007	−0.12	0.12	0.15	0.82	−0.03	0.03
Press freedom	0.002	0.0004	−0.01	0.02	0.07	0.82	0.002	0.002
Confidence in parliament	−0.021	−0.004	−0.45	0.64	0.05	0.52	0.02	0.12
Ethnic diveristy	0.064	0.013	−0.43	0.62	0.02	0.70	0.08	0.14
Orthodox	−0.001	−0.0002	−0.01	0.005	0.09	0.76	−0.001	0.001
Muslims	0.003*	0.001	−0.003	0.01	0.80	0.96	0.003	0.001
Hindi	−0.002	−0.0003	−0.17	0.07	0.01	0.59	−0.0001	0.003
Buddhists	−0.003	−0.001	−0.23	8.27	0.24	0.86	0.03	0.01
Social trust	0.003	0.001	−0.01	0.01	0.15	0.87	0.003	0.003

Note: Individual level determinants and area dummies are included but not reported; * denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level

high income suffer from better governance; in the full sample, men and people with middle and high income are worse off with better legal quality. Moreover, better regulatory quality robustly decreases well-being of people with low and middle incomes. In an attempt to explain the latter, more intrusive regulations of the business sector and labor market might be detrimental to life satisfaction of people with lower and middle income. However, these puzzling results clearly need further research (which is beyond the scope of this paper).

Turning to religion, the results show that there is some significant impact of having a large group of a particular denomination in society on some groups. This result is particularly noteworthy as we have already controlled for individual religious denominations and included regional dummies in our regressions.[39] For this reason, at the societal level it is probably more suitable to think of these as 'aggregate religious denominations' in the form of specific 'cultural traits and norms' generated by the share of persons linked to a particular religious tradition. For example, the share of Buddhists is detrimental to the life satisfaction of men only, but not in any other sample. Thus, it might well be that the negative impact of Buddhist culture on men compared to that on women reflects a gender bias in the Buddhist value system: those virtues in this life whose fulfillment determine the type of the next incarnation differ between genders as men appear to be significantly more burdened than women.[40] Moreover, a stronger influence of Muslim tradition appears conducive to females and left-wing voters. In Islam as in all Judeo-Christian traditions, single persons are called to contribute to a fair income distribution in society and as such, these religions favor allocations closer to the preferences of left-wing voters and financially less secured women.[41] With respect to the detrimental effects of large Orthodox populations on left-wing voters, this may simply reflect that predominantly Orthodox Eastern European countries tend to have progressed more slowly in their transition from communism compared to the postcommunist countries which formed part of the Austrian-Hungarian Empire until the end of World War I.

Finally, ethnic diversity is associated with rising life satisfaction for persons with middle income, and those with a right-wing ideology, and does thus not seem to increase the type of conflicts associated with well-being (hypothesis 21).

Contrary to expectations, insignificant determinants of life satisfaction throughout all subgroups are formal institutional rules such as press freedom, but also informal ones like the lack of corruption and the share of Hindi in

[39] Again, a similar finding was reported in Bjørnskov et al. (2005) for both Hindi and Muslim groups, but, in general, with significances more often observed also in the other income or ideology groups. This analysis, however, was solely based on aggregate determinants of average life satisfaction.

[40] For more information on Buddhism, see Encyclopaedia Britannica or Wikipedia at http://en.wikipedia.org/wiki/ Buddhism (27/09/2005).

[41] Islamic philosophy, in principle, still does not permit levying interest on money ('usury'), as it was the case until the late Middle Ages in Europe. In addition, the Old Testament already sets explicit rules for income redistribution measures (e.g., communal support of widows, remission of debt, release of slaves, etc.).

the population. Also the social capital indicators, confidence in parliament and generalized trust among citizens, turn out to be not robustly related to life satisfaction. The reason might be that the latter two factors have been taken into account at the individual level, where both are highly significant, while the share of Hindi most probably coincides too strongly with the individual-level religion measures due to its low world-wide promulgation.

4.4 Human development and culture

Table 6 presents the results for human development and cultural factors. As can be seen, infant mortality—our only baseline variable in this category—is extremely robust in all samples, and its marginal impact is comparably big across groups. Again, the average beta resulting from the EBA is quite similar to the coefficient obtained in the ordered probit regressions. As in the full sample, higher infant mortality is detrimental to individual life satisfaction among all subgroups (supporting hypothesis 23).

The results also show that few of the additional variables robustly affect well-being. One exception is primary schooling, robustly increasing well-being in the full sample; the same is true for men, women, right-wing voters and the middle-income group. Although these findings are in line with hypothesis 24, the insignificance in the low income group might indicate that people with some education compare their social position with those earning more, preventing them from deriving satisfaction from their education. Secondary schooling, on the other hand, does not contribute to life satisfaction in any group, while average IQ even reduces satisfaction in the left-wing and lower income group. This finding contradicts hypothesis 24 and might support an alternative 'happy ignorance' hypothesis.

Consistent with previous cross-country findings in Bjørnskov et al. (2006), our results also show negative effects of gender equality. However, gender equality exerts a robust impact in only two of the samples, namely for left- and right-wing voters, indicating that gender equality may only matter for people with sufficient political interest to hold clear political opinions. The equality of the marginal effects indicates that both groups are equally negatively affected, independent of their political orientation.

Finally, we find robust effects of geography on life satisfaction. Both latitude and longitude are robust determinants of well-being in some of the samples. Specifically, men, right-wing voters and the lower income group are less satisfied when residing in countries which are located farther away from the equator in either direction—and the same is true for the full sample. In interpreting this result, it might be useful to note that those countries with the highest latitude (maximum: 90°) are the Middle- and Northern European countries (except for Canada and partly Russia where only small populations live in the northern-most regions), while African and South-American states have the smallest values. Thus, this finding contradicts hypothesis 27, stating people in moderate climates to be more satisfied with their lives. Latitude therefore rather seems to inversely proxy the North-South division of the world, and thus trade patterns,

Table 6 Cultural and human developmental determinants of life satisfaction

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Full Sample								
Baseline								
Infant mortality	−0.006**	−0.001	−0.02	0.01	0.94	0.99	−0.01	0.003
Additional								
Primary schooling	0.004**	−0.001	−0.003	0.01	0.85	0.97	0.004	0.002
Secondary schooling	−0.001	−0.0001	−0.01	0.004	0.21	0.74	−0.001	0.002
Averagae IQ	−0.003	−0.001	−0.03	0.02	0.04	0.75	−0.005	0.01
Fertility	−0.024	−0.004	−0.19	0.18	0.00	0.66	−0.02	0.05
Life expectancy	0.006	−0.001	−0.03	0.06	0.05	0.76	0.01	0.01
Gender equality	−0.005	−0.001	−0.02	0.01	0.25	0.83	−0.01	0.005
Average temperature	−0.0003	−0.0001	−0.05	0.02	0.00	0.59	−0.002	0.01
Latitude	−0.004*	−0.001	−0.02	0.004	0.66	0.95	−0.005	0.003
Longitude	0.001	−0.0001	−0.002	0.003	0.13	0.87	0.001	0.001
English speaking	−0.013	−0.002	−0.29	0.23	0.01	0.54	−0.01	0.06
Male								
Baseline								
Infant mortality	−0.004*	−0.001	−0.02	0.01	0.69	0.95	−0.01	0.003
Additional								
Primary schooling	0.005**	0.001	−0.002	0.01	0.98	0.99	0.005	0.002
Secondary schooling	−0.0003	−0.0001	−0.01	0.005	0.05	0.69	−0.001	0.002
Averagae IQ	−0.002	−0.0004	−0.03	0.02	0.02	0.68	−0.004	0.01
Fertility	−0.039	−0.006	−0.21	0.15	0.03	0.80	−0.04	0.05
Life expectancy	0.001	0.0001	−0.04	0.05	0.00	0.54	0.001	0.01
Gender equality	−0.004	−0.001	−0.02	0.02	0.16	0.77	−0.004	43.00
Average temperature	0.003	0.001	−0.05	0.03	0.00	0.54	0.0004	0.01
Latitude	−0.005**	−0.001	−0.02	0.003	0.91	0.97	−0.01	0.003
Longitude	0.001	0.0001	−0.002	0.003	0.12	0.82	0.001	0.001
English speaking	−0.060	−0.010	−0.36	0.18	0.03	0.75	−0.05	0.06

Table 6 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Female								
Baseline								
Infant mortality	−0.007***	−0.001	−0.02	0.004	0.99	1.00	−0.01	0.003
Additional								
Primary schooling	0.003*	0.001	−0.005	0.01	0.35	0.91	0.003	0.002
Secondary schooling	−0.001	−0.0001	−0.01	0.004	0.26	0.76	−0.001	0.002
Averagae IQ	−0.003	−0.001	−0.03	0.02	0.05	0.76	−0.005	0.01
Fertility	−0.013	−0.003	−0.20	0.22	0.00	0.54	−0.005	0.06
Life expectancy	0.011	0.002	−0.02	0.07	0.15	0.89	0.01	0.01
Gender equality	−0.005	−0.001	−0.02	0.01	0.24	0.84	−0.01	0.005
Average temperature	−0.003	−0.001	−0.04	0.02	0.00	0.69	−0.004	0.01
Latitude	−0.003	−0.001	−0.02	0.005	0.18	0.89	−0.003	0.003
Longitude	0.001	0.0001	−0.002	0.003	0.14	0.88	0.001	0.001
English speaking	0.033	0.006	−0.25	0.28	0.09	0.69	0.03	0.06
Left								
Baseline								
Infant mortality	−0.005***	−0.001	−0.02	0.01	0.84	0.96	−0.005	0.002
Additional								
Primary schooling	0.002	0.0003	−0.005	0.01	0.08	0.78	0.001	0.001
Secondary schooling	0.001	0.0001	−0.004	0.004	0.00	0.54	0.0001	0.001
Averagae IQ	−0.005	−0.001	−0.04	0.01	0.29	0.91	−0.01	0.01
Fertility	−0.024	−0.004	−0.21	0.19	0.02	0.65	−0.02	0.05
Life expectancy	0.006	0.001	−0.02	0.06	0.18	0.81	0.01	0.01
Gender equality	−0.010***	−0.002	−0.02	0.005	0.97	0.99	−0.01	0.004
Average temperature	−0.004	−0.001	−0.04	0.02	0.01	0.68	−0.004	0.01
Latitude	−0.002	−0.0003	−0.02	0.005	0.17	0.85	−0.003	0.002
Longitude	−0.001	0.0001	−0.001	0.002	0.03	0.81	0.0004	0.0005
English speaking	0.046	0.008	−0.13	0.21	0.10	0.82	0.05	0.05

Table 6 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Right								
Baseline								
Infant mortality	−0.005**	−0.001	−0.02	0.01	0.87	0.97	−0.01	0.003
Additional								
Primary schooling	0.003*	0.001	−0.005	0.01	0.54	0.93	0.003	0.002
Secondary schooling	−0.001	−0.0002	−0.01	0.005	0.09	0.81	−0.002	0.002
Averagae IQ	0.001	0.0002	−0.03	0.02	0.03	0.58	−0.002	0.01
Fertility	−0.034	−0.007	−0.22	0.18	0.01	0.75	−0.03	0.05
Life expectancy	0.008	0.002	−0.03	0.06	0.03	0.76	0.01	0.01
Gender equality	−0.011***	−0.002	−0.02	0.01	0.98	0.99	−0.01	0.004
Average temperature	−0.001	−0.0002	−0.04	0.03	0.00	0.63	−0.003	0.01
Latitude	−0.005**	−0.001	−0.02	0.003	0.84	0.97	−0.01	0.003
Longitude	0.001	0.0002	−0.001	0.004	0.42	0.93	0.001	0.001
English speaking	−0.044	−0.009	−0.40	0.26	0.04	0.63	−0.03	0.07
Low Income								
Baseline								
Infant mortality	−0.005**	−0.001	−0.02	0.01	0.89	0.97	−0.01	0.003
Additional								
Primary schooling	0.002	0.0004	−0.01	0.01	0.11	0.87	0.002	0.002
Secondary schooling	−0.001	−0.0001	−0.01	0.003	0.00	0.72	−0.001	0.002
Averagae IQ	−0.013**	−0.002	−0.04	0.01	0.94	0.98	−0.01	0.01
Fertility	−0.017	−0.003	−0.23	0.20	0.01	0.64	−0.02	0.05
Life expectancy	0.007	0.001	−0.04	0.06	0.01	0.74	0.01	0.01
Gender equality	−0.005	−0.001	−0.03	0.01	0.15	0.83	−0.01	0.005
Average temperature	0.001	0.0002	−0.05	0.03	0.00	0.50	−0.0005	0.01
Latitude	−0.005**	−0.001	−0.02	0.003	0.90	0.98	−0.01	0.003
Longitude	0.001**	0.0002	−0.001	0.003	0.83	0.97	0.001	0.001
English speaking	0.058	0.010	−0.21	0.29	0.15	0.82	0.06	0.06

Table 6 continued

	(1) Individual reg.	(2) Marginal effect	(3) Lower bound	(4) Upper bound	(5) % sign	(6) CDF (0)	(7) Beta	(8) Std. Dev.
Middle income								
Baseline								
Infant mortality	−0.008***	−0.001	−0.03	0.01	0.99	1.00	−0.01	0.003
Additional								
Primary schooling	0.004*	0.001	−0.01	0.01	0.27	0.90	0.003	0.002
Secondary schooling	−0.002	−0.0003	−0.01	0.004	0.31	0.88	−0.002	0.002
Averagae IQ	−0.0004	−0.0001	−0.03	0.02	0.00	0.60	−0.002	0.01
Fertility	−0.031	−0.005	−0.21	0.18	0.00	0.72	−0.03	0.05
Life expectancy	0.008	0.001	−0.03	0.06	0.04	0.77	0.01	0.01
Gender equality	−0.006	−0.001	−0.03	0.02	0.27	0.88	−0.01	0.01
Average temperature	−0.002	−0.0004	−0.05	0.02	0.01	0.68	−0.004	0.01
Latitude	−0.004	−0.001	−0.02	0.01	0.09	0.88	−0.004	0.003
Longitude	0.001	0.0001	−0.002	0.004	0.09	0.85	0.001	0.001
English speaking	−0.057	−0.010	−0.43	0.23	0.01	0.71	−0.05	0.08
High Income								
Baseline								
Infant mortality	−0.007*	−0.001	−0.02	0.01	0.92	0.98	−0.01	0.003
Additional								
Primary schooling	0.003	0.001	−0.01	0.01	0.03	0.76	0.002	0.003
Secondary schooling	−0.001	−0.0002	−0.01	0.003	0.27	0.78	−0.002	0.002
Averagae IQ	−0.003	−0.001	−0.04	0.03	0.00	0.63	−0.003	0.01
Fertility	0.051	0.010	−0.18	0.29	0.03	0.77	0.05	0.06
Life expectancy	0.002	0.0003	−0.04	0.07	0.01	0.63	0.01	0.01
Gender equality	0.001	0.0001	−0.02	0.02	0.00	0.57	0.001	0.01
Average temperature	0.004	0.001	−0.03	0.04	0.00	0.62	0.003	0.01
Latitude	−0.001	−0.0003	−0.01	0.01	0.01	0.70	−0.0002	0.003
Longitude	0.001	0.0001	−0.001	0.004	0.38	0.92	0.001	0.001
English speaking	−0.067	−0.013	−0.48	0.24	0.03	0.68	−0.05	0.08

Note: Individual level determinants and area dummies are included but reported; * denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level

economic development, and quality of political institutions (which we cannot fully control for). In contrast, individuals with low and high incomes and right-wing voters are more satisfied in countries located on a higher longitude; the farther away the country from the zero meridian in Greenwich (UK) either in the Eastern or Western direction up to 180°, the better off feel its citizens.

Other factors suggested as important determinants of well-being in the previous literature turn out to be not robustly related to life satisfaction. In particular, our results thus clearly contradict that life expectancy, fertility, and average temperature determine well-being. In addition, we find the coefficient of the English language dummy not to be robustly related to well-being, contradicting Dorn et al. (2006).

5 Summary of results and discussion

Our findings support a number of results previously reported in the empirical literature on life satisfaction as well as neoclassical and public choice theory, while refuting others. First of all, following a general-to-specific analysis, our baseline specification of aggregate variables comes to consist of openness to trade, relative investment price levels, infant mortality, the number of years a country has been independent, the shares of Protestants and Catholics in populations, having a bicameral political system, and communist past. While our Extreme Bounds Analysis shows that these baseline variables are in most cases robustly related to life satisfaction of individuals in all groups investigated here, we find some differences in the magnitude with which these factors influence subjective well-being among the groups divided along income, gender and political conviction. While the influence of openness, higher investment prices, infant mortality and communist past is in line with our hypotheses, this is not true for history of independence and bicameralism. Religious cultural traits positively impact well-being.

We tested a large set of additional macro-level variables that have been suggested to affect life satisfaction in the previous happiness literature. We grouped these variables into the four broad categories of economic, political, and institutional variables, and determinants relating to human development and culture. Among the political factors, we observe people with high income to be least affected by the detrimental effects of stark political changes. Furthermore, government fractionalization raises the well-being of right-wing voters and people with low income. Democratic institutions are usually not directly important for well-being, but do affect life satisfaction of persons with either left-wing or right-wing ideology via democratic legacy or monarchy.

Among the economic variables, the additional factors are spread unevenly across different groups in society. To mention the most important results, we find that people with clearly stated political convictions—left-wing or right-wing ideology—suffer from high government consumption, low national income and high unemployment, while these variables are not robustly related to well-being in the full sample. Redistributive government activities increase life satisfaction

in the full sample and in those subpopulations which traditionally belong to the deprived or favor such policy because of their political conviction. Subsidies, however, work similarly beneficial for these groups, but also increase well-being of further subpopulations, including men and right-wing voters. There are additional beneficial influences of globalization on right-wing persons and deleterious ones of public debt on people with high income (who might expect having to pay higher taxes in the future).

Regarding institutional factors, we observe that, overall, governance is *negatively* associated with life satisfaction—contradicting our expectations and the previous literature. We have no consistent and comprehensive explanation for this. Also contrary to popular beliefs in many countries, we find that ethnic diversity increases well-being in the right-wing and middle income samples, while stronger Buddhist traits in society are detrimental to male life satisfaction. Islamic tradition, however, is conducive to the well-being of women and left-wing voters, probably resulting from the pro-income redistribution philosophy of Islam.

Finally, among the various human development indicators included in the analysis, enrollment in primary schools robustly increases life satisfaction of men and women, right-wing voters and middle income earners alike, but—surprisingly—not that of people with low income. The national average score in standardized intelligence tests (IQ), however, turns out to have a significantly negative effect on life satisfaction for left-wing voters and people with low income. We also find that gender equality reduces well-being of those who are interested in political matters only, while some effects observed for geographical factors are less intuitive.

As such, the results hold broad and rather complex implications for the theory of life satisfaction as most effects can be attributed to several categories. The first category, pertaining to a better match of supplied goods to consumers' preferences, comprises openness to trade, government spending, globalization, public debt, and national income. The strong positive association between life satisfaction and openness to trade and its negative association with the government's share of total income for some groups both point in the same direction. When governments spend relatively more of national income, the share within the control of individuals necessarily decreases. Moreover, state-owned enterprises, in which some of this income is generated, are subject to political demand and control, and less to market demand than private enterprises, implying that publicly produced private goods may tend to be less aligned with the preferences of consumers than those produced privately. The same argument holds for higher public debt which reduces the financial means available at the discretion of the politicians or implies higher future taxes. Similarly, higher national income reflects the more relaxed budget constraint of both government and individuals alike—an explanation supported by our finding that income is very robust in the two subsamples by political conviction, but not in any other group where a substantial part have no clearly stated political convictions. The same main conclusion, but with the opposite sign, applies to openness to trade and globalization. New economic trade theory stresses the non-pecuniary benefits

of globalization, leading to welfare improvements through an increase in the variety of goods, which makes it easier for individuals to fit their consumption to their own preferences. The overall implication thus seems to be that the quality of individual consumption and individuals' control over its composition in particular matter for life satisfaction.

A second category of variables important for perceived well-being comprises government activities that may affect individuals' relative status in society. Subsidies and higher marginal tax rates both exert positive and robust influences on people with middle income, comprising those people most likely to benefit from these factors in relative terms. As such, even if subsidies and tax progressivity are often thought to be detrimental to the national economy as a whole, the 'middle class' is probably made better off when compared to other segments of society. The same may apply to access to general schooling, which exerts a positive influence on roughly the same groups in society in the form of primary schooling enrollment.

The institutional influences also point in opposite and somewhat confusing directions. For the detrimental effects of communist past and the number of years a country has been independent, our explanation was based on the non-fulfillment of exaggerated expectations and the adoption to pre-change set points after gaining independence. An additional explanation consistent with anecdotal evidence suggests that both former communist and very long-established countries tend to be shaped by rather hierarchical and sclerotic social structures, reducing social mobility. In other words, both measures may capture the perceived inability of individuals to move up in the social hierarchy through their own doing, which thus entails a substantial loss of personal control. On the other hand, the negative and robust effects of other governance measures are truly puzzling. We cannot offer any consistent and comprehensive explanations, but have to point to this topic as an area that needs further research, in particular since such measures have been shown to strongly and positively affect economic growth and stability.

6 Conclusions

The literature on cross-country determinants of life satisfaction has generated a large number of factors that supposedly affect individual satisfaction with life across countries. In this paper, we have employed Extreme Bounds Analysis to test whether a number of these macro factors do robustly influence life satisfaction; that is, whether the findings of previous studies survive a sensitivity test regularly applied in recent empirical work. As a second robustness test applied in this paper, we split the national samples in three ways, enabling us to compare the impacts of the factors on the lower, middle, and upper third of the personal income distributions, men and women separately, and voters to the left and right of the national political middle. This allows us to obtain more accurate estimates of diverse factors whenever they have differential impacts on separate groups in society.

According to our results, only some of the potential aggregate determinants of life satisfaction proposed in the previous literature survive our robustness tests. First, from a social as well as a political point of view, it seems comforting to find that a set of cross-national factors appears to constitute a baseline specification that is common to all groups in society. Yet, we also tested a large set of additional factors that might potentially affect life satisfaction. Among them, however, none is robustly related to well-being both among the subpopulations and the whole population, while a number of variables that are robustly related to life satisfaction in specific subgroups in society are not robust predictors of others.

Our results from in depth robustness analysis of the overall population, however, do not confirm the impact of the majority of the variables suggested in previous studies. Among them are, e.g., national income, welfare state characteristics, democracy, unemployment rates, and higher education—all of which have previously been presented as significant predictors of satisfaction. This clearly shows that it is not sufficient to report those results that authors prefer but to take the robustness to the inclusion of additional variable properly into account. Our results equally stress the need for more statistical care in this literature. Ideally, systematic analysis like the one presented here—also including analyses by social subgroups—could complement the results to give the reader some sense of the robustness of the findings reported.

As a last comment, it must be stressed that we have not considered differential impacts of any variable across characteristics that pertain to countries. As such, all factors are assumed to have the same impact on specific societal groups across countries, which may not be a natural assumption. Given that our source of the life satisfaction data—the World Values Survey—tends to over-represent developed countries, it remains an open question whether our results would change if the sample would be restricted to relatively poor countries. However, such exercises must await the collection of representative data for a sufficient number of developing countries. While our work thus stresses the overriding importance of exploring the robustness of empirical findings, an important question for future research is therefore whether factors have heterogeneous impacts across countries, depending on their specific social, cultural, political and economic characteristics.

Appendix A Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Life satisfaction	87748	6.477	2.602	1	10
Baseline model—Individual level variables					
Buddhist	87748	0.013	0.113	0	1
Muslim	87748	0.188	0.391	0	1
Catholic	87748	0.331	0.471	0	1
Protestant	87748	0.011	0.104	0	1
Orthodox	87748	0.071	0.257	0	1
other Christian denomination	87748	0.027	0.163	0	1

Appendix A continued

Variable	Obs	Mean	Std. Dev.	Min	Max
no denomination	87748	0.178	0.383	0	1
Jewish	87748	0.004	0.061	0	1
Hindu	87748	0.019	0.137	0	1
ideology missing	87748	0.269	0.444	0	1
conservative ideology	87748	0.333	0.471	0	1
has confidence in parliament	87748	0.372	0.483	0	1
trusts most people	87748	0.268	0.443	0	1
Income level 2	87748	0.142	0.349	0	1
Income level 3	87748	0.149	0.356	0	1
Income level 4	87748	0.157	0.364	0	1
Income level 5	87748	0.131	0.338	0	1
Income level 6	87748	0.105	0.307	0	1
Income level 7	87748	0.082	0.274	0	1
Income level 8	87748	0.060	0.237	0	1
Income level 9	87748	0.040	0.197	0	1
Income level 10 (highest)	87748	0.040	0.196	0	1
Age 25–34	87748	0.238	0.426	0	1
Age 35–44	87748	0.216	0.411	0	1
Age 45–54	87748	0.161	0.367	0	1
Age 55–64	87748	0.111	0.314	0	1
Age >64	87748	0.104	0.306	0	1
Male	87748	0.487	0.500	0	1
Completed primary education	87748	0.154	0.361	0	1
Incomplete sec., techn.	87748	0.092	0.289	0	1
Complete sec., techn.	87748	0.143	0.351	0	1
Incomplete sec., uni prep	87748	0.104	0.305	0	1
Complete sec., uni prep	87748	0.176	0.381	0	1
Lower level tertiary edu	87748	0.082	0.275	0	1
Upper level tertiary edu	87748	0.129	0.335	0	1
Single female	87748	0.050	0.218	0	1
Single male	87748	0.013	0.112	0	1
Married	87748	0.567	0.496	0	1
Cohabiting	87748	0.039	0.194	0	1
Has had 1 child	87748	0.145	0.352	0	1
Has had 2 children	87748	0.253	0.435	0	1
Has had 3 or more children	87748	0.291	0.454	0	1
Selfemployed	87748	0.097	0.295	0	1
Housewife	87748	0.143	0.350	0	1
Retired	87748	0.130	0.336	0	1
Other	87748	0.020	0.140	0	1
Student	87748	0.069	0.253	0	1
Unemployed	87748	0.086	0.280	0	1
Service part.: > once a week	87748	0.125	0.331	0	1
Service part.: once a week	87748	0.189	0.392	0	1
Service part.: one a month	87748	0.119	0.324	0	1
Service part.: on common holy days	87748	0.161	0.367	0	1
Service part.: on specific holy days	87748	0.024	0.152	0	1
Service part.: once a year	87748	0.073	0.260	0	1
Service part.: less than once a year	87748	0.086	0.281	0	1
Believes in superior being	87748	0.777	0.417	0	1
Baseline model—aggregate variables					
Bicameral parliament	87748	1.555	0.497	1	2
Years of independence	87748	231.701	400.037	10	2001

Appendix A continued

Variable	Obs	Mean	Std. Dev.	Min	Max
Postcommunism, dummy	87748	0.260	0.439	0	1
Openness to trade	87748	68.278	48.452	15.428	324.437
Investment price	87748	0.833	0.363	0.261	1.951
Protestants (%)	87748	30.012	38.051	0	98
Catholics (%)	87748	13.022	24.747	0	95
Infant mortality	87748	24.867	24.466	2.9	104
Asia	87748	0.129	0.335	0	1
Latin America	87748	0.171	0.377	0	1
Africa	87748	0.048	0.215	0	1
Middle East and North Africa	87748	0.133	0.340	0	1
Political factors					
Government fractionalization	87748	0.712	0.216	0.247	1
Political ideology, 10-year	87748	0.074	0.475	−1	1
Political ideology, current	87748	0.004	0.442	−1	1
Democracy, Gastil index	87748	2.820	1.817	1	6
Democracy, Polity IV	87045	5.404	5.272	−7	10
Democratic legacy	87748	17.826	15.033	0	40
Monarchy	87748	0.169	0.375	0	1
Economic factors					
Average tariff rate	79016	10.349	7.288	0	32.6
Income inequality	80408	3804.719	955.429	2150	6343
GDP per capita	87748	8.929	0.950	6.178	10.692
Government consumption	87748	17.560	9.188	5.228	49.881
Inflation	86933	16.077	31.012	−0.100	242.309
Unemployment	82441	9.577	5.472	1.08	33.4
Globalization index, 1995	79619	3.121	1.198	1.07	6.09
Compound growth, 5-years	83863	0.089	0.106	−0.163	0.484
Growth stability	79564	0.036	0.022	0.008	0.113
Subsidies	80150	43.682	18.857	2.818	74.181
Top marginal tax rate	79964	37.029	10.007	0	59
Public debt, % of GDP	78507	53.610	29.713	5	164.3
Access to technology	87748	144.298	148.999	0.444	499.466
Institutional factors					
Governance	87748	0.247	0.972	−1.337	1.942
Legal quality	79016	6.327	2.050	2.35	9.62
Regulatory quality	79016	6.005	1.010	3.09	8.23
Lack of corruption	87748	4.640	2.446	1.5	9.7
Press freedom	87748	41.369	22.476	8	83
Confidence in parliament	86335	2.575	0.320	1.403	3.143
Ethnic diversity	87748	0.362	0.220	0.002	0.930
Orthodox (%)	87748	10.594	27.823	0	98
Muslims (%)	87748	13.149	28.497	0	99.8
Hindi (%)	87748	2.027	11.833	0	81.3
Buddhists (%)	87748	1.130	9.263	0	84
Social trust (%)	87748	26.939	13.842	4.752	65.349
Human development factors					
Primary schooling	86335	103.283	11.784	63.260	162.296
Secondary schooling	84423	82.566	27.414	4.824	160.760
Average IQ	87748	91.760	8.207	66	106
Fertility	87748	3.016	1.417	1.435	6.973
Life expectancy	87748	71.492	7.967	38.961	81.563
Gender discrimination	83329	98.445	6.980	71.744	114.600
Average temperature	83655	14.290	6.284	4.2	27.2

Appendix A continued

Variable	Obs	Mean	Std. Dev.	Min	Max
Latitude	86806	34.798	17.439	1	65
Longitude	86806	49.729	39.403	2	174
English speaking	87748	0.106	0.308	0	1

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